

The IRON AGE

Contents p. 2

THE NATIONAL METALWORKING WEEKLY September 22, 1949

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SEP 22 1949

Nothing Rolls Like a Ball ...

Chosen with
complete confi-
dence wherever
ball bearings of
top quality are
required.

NEW DEPARTURE BALL BEARINGS

NEW DEPARTURE - Division of GENERAL MOTORS

BRISTOL, CONNECTICUT

World's largest forging press is lubricated with 2 Farval systems

THE builder of this 18,000-ton hydraulic die forging press made certain it would receive adequate lubrication by equipping it with two Farval systems. One serves 24 points of lubrication on the column guide bushings and plunger seat, the other serves 32 points on the gland rings of main and push back cylinders.

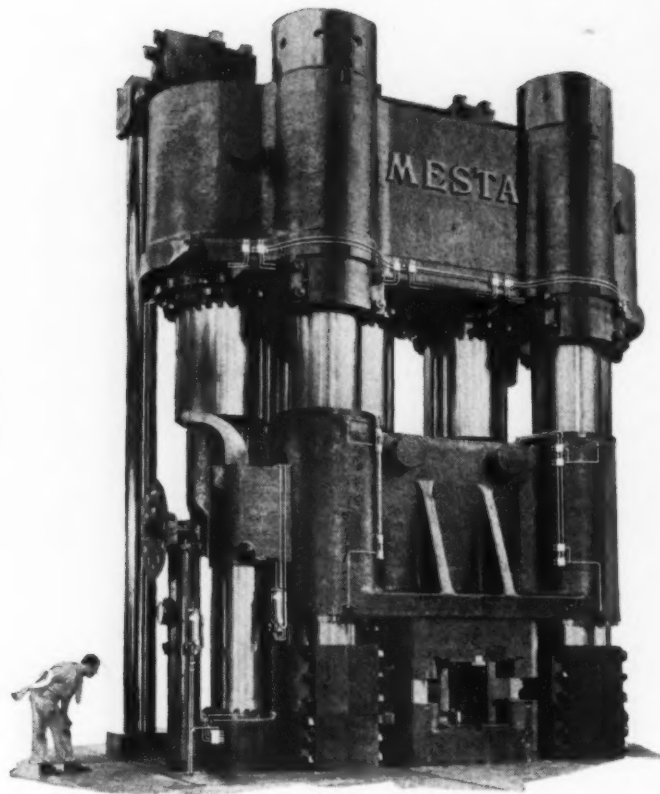
Hundreds of Farvalized presses are in use in forging and metal working shops. The benefits of Farval Centralized Lubrication are fourfold—oiling labor is saved, lubricant is saved, bearing expense saved and production time saved. In one plant, for example, installation of 133 Farval systems to serve 3100 bearings on metal-forming presses saved the labor of 11 oilers per day.

In another plant, Farval solved the problem of delivering oil regularly and adequately to the Pitman bearings of a large forging press, thereby ending frequent shutdowns for overhauls costing \$3500 to \$5000 each in parts and labor alone. In a third plant, five Farval-equipped dieing machines ran continuously for 10,000 hours, while alongside, 12 similar machines without Farval had to be shut down every four hours for hand oiling. Thus production was increased 14% on the Farval-equipped machines and maintenance was only 1/4 as great.

Farval has proven itself in over 20 years of service. It is the original Dualine system of centralized lubrication that others imitate. The Farval valve has only 2 moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Through its wide valve ports and full hydraulic operation, Farval unfailingly delivers grease or oil to each bearing—as much as you want, exactly measured—as often as desired. Indicators at every bearing show that each valve has functioned. For a full description, write for Bulletin No. 25.

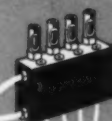
The Farval Corporation, 3252 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



FARVAL—Studies in
Centralized Lubrication
No. 107

FARVAL



**CENTRALIZED
SYSTEMS OF
LUBRICATION**



DIFFICULT BOLTING JOB?

Call for a "Special"

Bolting jobs often arise in which the use of standard fastenings is uneconomical. In such cases, users often turn to "specials"—fastenings which are specially designed and manufactured to meet particular requirements.

Supplying "specials" for the endless needs of industry is in itself a specialty of Bethlehem's Lebanon, Pa., plant. Lebanon Plant is well equipped for fastenings manufacture, and has complete facilities for turning out virtually any type of fastening imaginable. In addition, we produce a wide range of standard items: machine and carriage bolts, rivets, nuts and spikes.

Next time you have a difficult bolting job, talk it over with one of our experienced engineers. We'll be pleased to hear from you at any time.



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September 22, 1949

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Promotion Manager

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Chestnut and 54th Sts.
Philadelphia 39, Pa., U.S.A.
Editorial and Advertising Offices
100 E. 42nd St., New York 17, N.Y., U.S.A.

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THE IRON AGE

Editorial

INDUSTRY VIEWPOINTS

Wanted—Collective Bargaining

LAST week we thought a steel strike had been averted. That the steel board's report would be used to bring forth a settlement—by real collective bargaining. We were wrong on the last count. There is still a chance that a tieup in steel may be prevented.

If prevented, it will not be by collective bargaining but by another dose of White House pressure. Collective bargaining in steel has given way to press releases, inspired news stories, angry telegrams for public consumption and use of the office of the President of the United States.

In these plays for support of the public, perspectives have been lost. Friendships have been broken. Confidence has given way to suspicion and bitterness. This is no healthy ground on which to build good management-labor relations.

Steel firms were forced into submitting to the steel labor board under protest. The union used the White House and a threat of a strike to gain steel firms' acceptance of the President's Proposal to go before the board.

The board's recommendations were and are good as a basis for further collective bargaining. No steel firm has refused to bargain. None has tossed the board's report in the ash can. That they were willing to sit down and talk about the report is evidence that it would be a basis for negotiations.

The union wants a complete agreement on the board's report BEFORE collective bargaining takes place. The play now is the same pattern as 60 days ago—any steel firm that does not accept the report in total will be struck. It is now time for the White House to again come into the picture. That is what the union wants.

Steel firms have gone a long way since they refused the union's demands 60 days ago. Two firms have agreed to put up 4¢ an hr for social insurance. No company has refused outright to put up 6¢ an hr on pensions AFTER a commission studies the problem and collective bargaining on pensions takes place. Nowhere has steel management said that employees should match penny for penny company payments.

Had it not been for the deplorable turn that the steel controversy has taken, it would not be wrong to assume that the union might have gotten the money payments the board recommended if the employees at least made some additional contribution. Steel people are fighting only the noncontributory feature of the board's report.

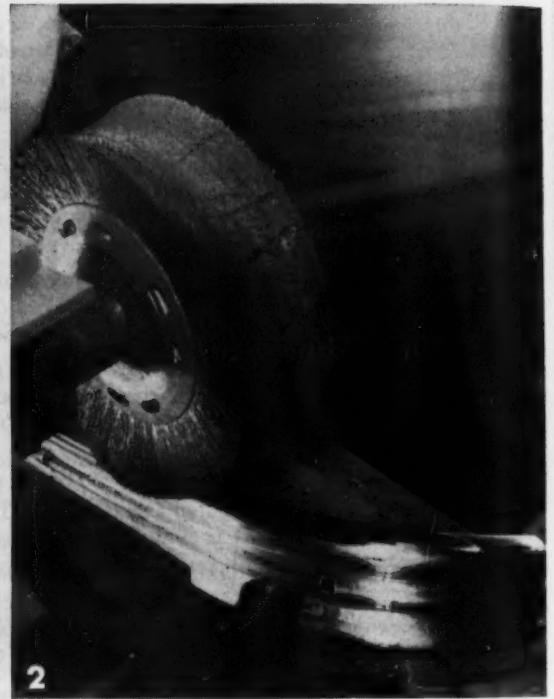
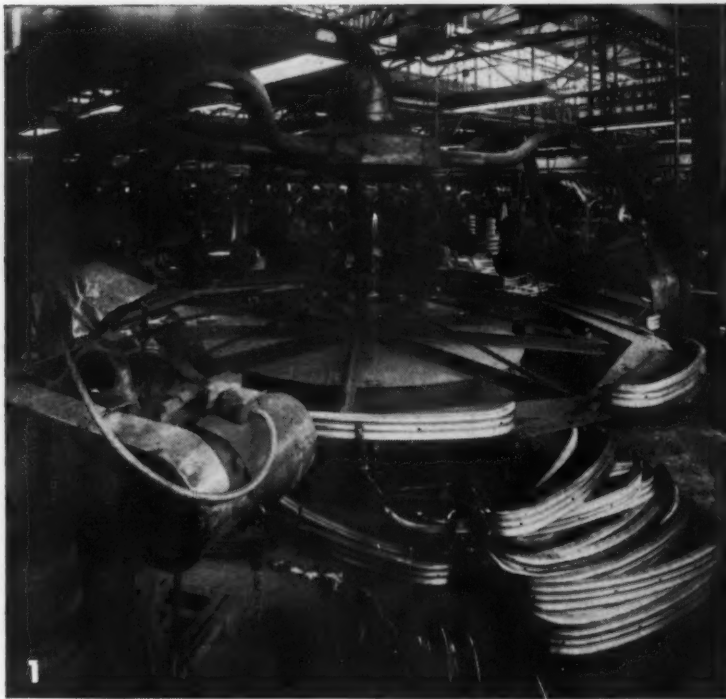
If cooler heads prevail this week, machinery may be set up to settle the pension disagreement which is fundamental. If it takes a crippling strike to do this the loss to workers and employers will be stupid and unnecessary.

And if it means that industrial heads who share in large scale noncontributory pensions must have this aired in public, well and good. That had to come sooner or later. But those who share in contributory pensions should not be pilloried because they do as they preach—both worker and employer pay for old age pensions.

Tom C. Campbell

Editor

... OSBORN FASCUT[®] POWER IMPROVE AUTO BUMPER



Above, photo 1: Rotary machine equipped with Osborn Fascut Brushes. Machine turns clockwise as brushes polish top edge of bumpers. Upper right, photo 2: Close-up of Fascuts on rotary machine applying final brushing operation to top edge of bumpers.

THE Auto-Lite plant at Sharonville, Ohio, is one of the world's largest producers of steel bumpers for motor cars.

By means of new finishing techniques, involving the use of Osborn Fascut[®] Power Driven Brushes, the company is mass producing auto bumpers with a satin-smooth high lustre finish that is extremely rust-resistant.

After forming, the bumpers are conveyed to a rotary machine equipped with Osborn Fascut

Power Brushes. Here, metal pit marks and surface imperfections are brushed away and the bumpers prepared for subsequent plating.

According to Company officials, the use of Osborn Fascut Power Driven Brushes results in fewer 'rejects' and reduces production costs.

The finishes on your metal products can be improved by the use of one or more of Osborn's complete line of cost cutting Power Driven Brushes. Contact us today.

Dept. 184, 5401 Hamilton Avenue

THE OSBORN MANUFACTURING COMPANY
CLEVELAND 14, OHIO

NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

- Some experimental alloys of titanium only slightly lighter than the pure metal and almost twice as strong have recently been developed. They are said to be superior to aluminum and magnesium base alloys, particularly at the higher temperatures that are beginning to show up in supersonic flight.
- There is an increasing tendency to heat treat castings to eliminate hard spots. One big manufacturing firm reports that tools used to machine heat treated castings last four times as long as when the same tools were used on untreated castings.
- A feature not given much attention in the steel fact finders report may prove a tough nut to crack. Steel companies strongly believe in compulsory retirement at age 65. The board thought not. Steel maintains pensions are to permit older men to retire. Because they are less alert, the fear is that too many in a plant will shoot up the accident rate.
- One reason for the recent pickup in pig iron sales is that the gray iron foundries have finally worked off the high priced scrap and foreign pig iron they bought last year.
- The automobile industry is constantly expanding its gaging requirements. In a typical car as many as 12,000 applications of precision gages have been noted. One auto firm's specifications call for 700 measurements per car within 0.001 in.
- Not all steelworkers thought that the steel board's recommendations were as good as the CIO chieftains proclaimed them to be. Inland Steel's local 1010 wired Phil Murray rejecting the findings, saying that they had a better plan in what Inland now has.
- A plastic that won't dissolve in any known solvent at ordinary temperatures and which is unaffected by sulfuric, hydrochloric and nitric acid has been developed as one result of atom bomb research. Called Fluorothene, it is being made commercially as well as at Oak Ridge. It has been fabricated into tubes, fittings, flasks and filters.
- Some nail and reinforcing bar production is now going into inventory. Construction, which normally takes about 80 pct of nail output, required only about 70 pct of first half shipments of 445,000 tons.
- An experimental method of steel analysis using X rays and a Geiger counter promises a charted result in a minute. In laboratory studies it has met with a measure of success in conjunction with special spectrographic equipment, revealing the kind and quality of alloying elements in steel.
- Two broaching machine manufacturers are planning soon to announce new lines that will feature design simplicity without extras. Each of the new machines will be multiple purpose units and it is expected that prices will be unusually low.
- England is down to its last 54 millionaires. Only 70 people there cleared more than \$24,000 after taxes last year though some 2200 had gross incomes of \$80,000 or more.

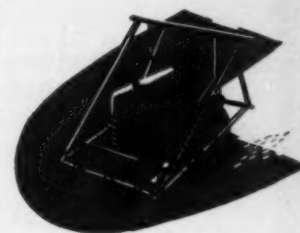
You Save Time and Money with
**Pittsburgh Seamless
 Mechanical Tubing**



Many manufacturers find they save time and money by standardizing on Pittsburgh Seamless Mechanical Tubing for parts and equipment. The size accuracy and excellent finish resulting from the cold drawing process make it possible to use many tubes without further machining which saves time and material. Where machining is desirable the cold reduction plus controlled heat treatment gives you a tubing with unusually good machining properties for standard low-carbon steel. Also the increase in tensile, yield and hardness values gives you strong, dependable parts with economy.

Pittsburgh Seamless mechanical tubing, both carbon and alloy, is being used successfully in many products such as spraying equipment, concrete vibrators, printing rolls, compressors, construction and hoisting machinery, machine tools, hoists, bakery equipment, paper machines, milk pasteurizers and agricultural equipment, to name but a few.

Specify Pittsburgh Seamless Mechanical tubing and save time and money in your operations. For information on how to order write Pittsburgh Steel Company, Dept. IA, Grant Bldg., Pittsburgh 30, Pa.



Pittsburgh Steel Company

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Oil-Tempered
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YOU CAN GET IT NOW!

YOU'LL CUT DOWN machine stoppages and minimize rejects with Roebling Oil-Tempered Spring Wire. This wire is a *quality* product. Every inch is identical in gauge and finish... uniformly up to snuff in mechanical and metallurgical properties.

Roebling Oil-Tempered Spring Wire is available now. Roebling has developed one of the largest wire mills in the country for making specialty wires. From making the steel to the finished product, every manufacturing phase is performed in Roebling's own plants.

Modern equipment and techniques assure the constant dependability that has earned Roebling a century of confidence.

Your Roebling Field Man will gladly help you choose the best wire—round, flat or shaped—for utmost efficiency and economy in your products. John A. Roebling's Sons Company, Trenton 2, New Jersey.

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For any size steel castings... for intricate, difficult castings... for unusual castings that require experienced "know-how"... Look to CONTINENTAL. Three large and complete foundries are at your service with extensive foundry, heat treating and machining facilities to give you early delivery on your toughest casting requirements. Send your prints for quotation.



Continental FOUNDRY & MACHINE CO.

CHICAGO • PITTSBURGH Plants at: East Chicago, Ind.; Wheeling, W. Va.; Pittsburgh, Pa.



Fatigue Cracks

By Charles T. Post

MONEY

Northern Metal Products Company's *Northerner* gives credit to a Chicago judge for puncturing the vanity of riches, then applying a cold patch.

"Money is not everything," he philosophized. "Money will not mend a broken heart or reassemble the fragments of a dream. Money cannot brighten the hearth nor repair the portals of a shattered home."

He paused, then added, "I refer, of course, to Confederate money."

AUTO SUGGESTION

When the brains department ordered your favorite family journal a new suit of clothes from the standpoint of makeup, the art and production departments snapped to attention.

"Use BIG pictures," commanded the editors. "We want the reader to see what's going on. And the photos must be fresh."

This policy, the experts now report, has its drawbacks. Take this note from W. E. Wenger, advertising manager, The Cleveland Twist Drill Co.:

"In connection with the photograph on page 73 (August 25 issue) entitled 'Paint Spray Finishing of Automobiles in Ventilated Booths,' it is my observation that the automobile bodies are 1941 Chevrolets. Inasmuch as this is a production line setup, my first thought was that a picture of a spray booth where 1950 automobiles are being finished would be very modern and eye-catching. I hope that you will pardon my observation, as I apparently always watch the little details which are insignificant. Don't take this seriously!"

Don't take it seriously, indeed. The brains department rushed to the teletype to sound four alarms for Walt Patton, your f.f.j.'s De-



troit fireman. Patton, calm and collected in any situation, gently squirted his CO₂ extinguisher on the flames.

"It was a Fisher Body 1948 model and could have been used on any one of several GM lines of cars. You seem to have forgotten that no basic body changes were made between 1941 and 1948 by Chevrolet," he tut-tutted.

The brains department returned to its stations with a sigh of relief, then suddenly remembered that what Reader Wenger wanted to see painted was 1950 models. It would have been better to have run the picture small, like we have it here.

LATEST MODEL

That wasn't the only blaze Fireman Patton was called upon to douse last week. The other he lit

Turn to Page 150



Putting Air to Work!



Here is another typical example of DeVilbiss' engineering "know-how." This spray booth, built specifically for the Ceramic finishing industry, recovers up to 99.3% of over-sprayed solids. Only one moving part—the blower—does the work. There are no nozzles, no pumps, no piping—nothing to wear out!

Here is a unique but unusually effective method of putting air to work. This tribesman owes his existence to a *Blowgun* . . . an ancient but lethal weapon still used in remote sections of Borneo. The Blowgun operates like a "beanshooter" with air power from the lungs employed to discharge a poisoned dart at great speeds and with amazing accuracy.

Wherever industry thrives you'll find another effective method of putting air to productive work. For example *spray guns* and complete spray systems designed and built by DeVilbiss enable manufacturers to operate so much more efficiently, they can produce for less—sell for less and do more business. The unsurpassed speed of these systems saves valuable manhours, cuts costs, increases production and improves the beauty and durability of finished products.

Wherever you have a painting or finishing operation, chances are a DeVilbiss engineer can prove to your complete satisfaction how you'll be ahead with the correct DeVilbiss equipment.

THE DEVILBISS COMPANY • Toledo 1, Ohio

Canadian Plant: WINDSOR, ONTARIO

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means Quality in all four . .

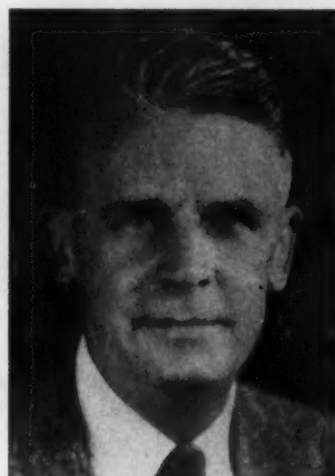


**SPRAY EQUIPMENT
EXHAUST SYSTEMS
AIR COMPRESSORS
HOSE & CONNECTIONS**

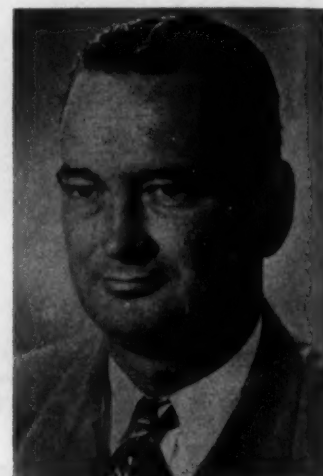
Iron Age Introduces



WALTER H. STEWART, vice-president Virginia Steel Co. Inc.



JOHN C. MURRAY, general sales manager, Edgar E. Brosius Co.



JAMES E. BROWN, assistant general superintendent, American Steel & Wire Co.'s Cuyahoga Works.

Walter H. Stewart has been appointed vice-president of VIRGINIA STEEL CO., INC., Richmond, Va. Formerly sales manager of the reinforcing products division, Truscon Steel Co. at Youngstown, Ohio, Mr. Stewart has devoted his entire career to the design and sale of steel building products for all types of building construction.

J. A. Street, supervisor of raw materials, SHEFFIELD STEEL CORP., Houston, Tex., will add the duties of acting purchasing agent to his schedule. A. F. Moog, former purchasing agent for the Houston operations, has resigned that position.

J. A. Durr, recently resigned as technical adviser to the general manager of the Albion Malleable Iron Co., Albion, Mich., has joined the staff of ERIE MALLEABLE IRON CO., Erie, Pa.

John C. Murray has become general sales manager of EDGAR E. BROSIUS CO., INC. He will make his headquarters at the company's plant in Sharpsburg, Pa. Mr. Murray has most recently been affiliated with Republic Steel Corp., Youngstown. He previously spent 33 years with Jones & Laughlin Steel Corp., Pittsburgh, as assistant general superintendent of the Pittsburgh works.

Jim Holland, for 12 years sales manager of the Phillips Division of American Screw Co., will take over the sales manager's post with CAMCAR SCREW & MFG. CORP. (formerly Camcar Products Co.) at Rockford, Ill. Ray Carlson, vice-president and general sales manager, will be relieved of his present sales duties by Mr. Holland. Mr. Carlson will devote his time fully to the production management of the corporation.

James E. Brown has been assigned to the newly-created position of assistant general superintendent of AMERICAN STEEL & WIRE CO.'s Cuyahoga Works, Cleveland. Mr. Brown moves to his new position from the staff of the vice-president of operations. He started as a weigher in the company's Newburgh wire works in 1930, and later became works superintendent.

E. A. Matteson, formerly sales engineer in the sheet and strip division of THE AETNA-STANDARD ENGINEERING CO., Youngstown, Ohio, has been made manager of export sales and manager of the patent division. R. L. Allshouse, previously sales engineer in the sheet and strip division, has become sales manager of the sheet and strip equipment division. D. C. Mills of the proposal engineering department has become a sales engineer.



ISHAM KEITH, machinery manager, Pratt & Whitney Division, Niles-Bement-Pond Co.; as announced in last week's issue.



R. L. WILSON, chief engineer, Brake Shoe & Castings Div., American Brake Shoe Co.; as announced in last week's issue.



W. C. ROWLAND, manager manufacturing and repair division, Westinghouse Electric Corp.

L. L. Colbert, president of the Dodge Division, has been elected a vice-president and director of CHRYSLER CORP., Detroit. **George W. Troost**, comptroller of the corporation, has been elected a vice-president. Mr. Colbert joined Chrysler Corp. in 1933 and has been steadily active in their executive management. Mr. Troost was assistant comptroller for 12 years before his appointment as comptroller in 1947.

Joseph B. Clough has been appointed vice-president, GODFREY TOOL & SUPPLY, INC., Cleveland. He was formerly with A. W. Hecker Co., and had previously been vice-president and sales manager of Johnston & Jennings Co.

W. L. Walsh has become general manager of sales in the Steel Division of THE STANLEY WORKS, Bridgeport, Conn. Mr. Walsh, who succeeds the late E. M. Hayes, has been district sales manager of the New York office for the past 5 years. He has worked in the sales division in various capacities for the past 25 years. **W. L. Hall** has been made district sales manager in the New York office, to succeed Mr. Walsh. Mr. Hall joined the company in 1937.

Edgar E. George has been appointed district sales representative for Baker Industrial Truck Division, BAKER-RAULANG CO., with headquarters in High Point, N. C. He will serve as material handling engineer for truck applications and will handle sales of the equipment. He was formerly with Dura-Products Mfg. Co., Canton, O., and was president of Mirro-Products Co., High Point, N. C.

Joseph M. Williams, Jr. is the new vice-president in charge of strip steel operations, UNIVERSAL SHEET AND STRIP STEEL CO., Chicago. Since 1922 Mr. Williams has been associated with Acme Steel Co. of Chicago in production, service, sales engineering and strip steel sales.

Paul W. Johnston has succeeded to the presidency of ERIE RAILROAD CO., Cleveland, upon the retirement of **Robert E. Woodruff**, who will become chairman of the board. Mr. Johnston has briefly been executive vice-president of the company. He began his railroading career at the age of 16 and served in many clerical, supervisory and executive posts until his present promotion to the highest place. Mr. Woodruff has been president since 1941, and has risen through the ranks of operating, personnel and management positions on the railroad during a 44-year career.

Clayton P. Innes has been promoted as manager of the Davenport branch office of CUTLER-HAMMER INC., Milwaukee. **E. J. Karl's** retirement after 28 years with the corporation was announced at the same time. Mr. Innes' advancement climaxed 11 years of service in the sales organization. **W. J. Phillips**, formerly of the Cincinnati district, will be manager of a new sales office opened by Cutler-Hammer at Louisville, Ky.

Harold R. Foss has been named acting manager of manufacturing engineering, on the manufacturing staff, FORD MOTOR CO. Mr. Foss will supervise and coordinate the company's departments of manufacturing engineering.

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W. C. Rowland has been made manager of WESTINGHOUSE ELECTRIC CORP.'s manufacturing and repair division. Mr. Rowland's appointment stems from the approaching retirement of vice-president **H. F. Boe** who has headed manufacturing and repair activities since 1938. **Roger H. Bolin**, formerly advertising manager of the corporation's appliance division at Mansfield, Ohio, has been named assistant to vice-president and general manager of consumer products. **J. R. Clemens** succeeds Mr. Bolin at his Mansfield post, after having served as assistant manager of appliance advertising.

Louis Ruthenburg has been elected to the new post of chairman of the board and chief executive officer of SERVEL, INC., Evansville, Ind. His previous positions in the corporation were president, general manager and director.

ANNOUNCING...

**A NEW LOW-COST PROCESS
FOR PRODUCTION OF**

WELDED PIPE... in sizes from 8 $\frac{5}{8}$ " to 30" O.D.
for water, gas, oil and steam

Initial Investment Reduced by **60%**

This completely new process embodies equipment for cold forming of skelp in specially designed hydraulic presses, and welding by the submerged arc method; also auxiliaries for conveying, processing, and finishing pipe in 40' lengths, in the range of sizes indicated above. All the equipment, with minor exceptions, is engineered and built by Yoder.

A pioneer plant, in commercial operation for over a year, already has demonstrated high dependability, with exceedingly low production and maintenance cost.

As the largest manufacturers in the world of Electric Resistance-Weld Pipe and Tube Mills, Yoder is in a position to supply unbiased information on the relative advantages of both types of mills, for any given application, location, and set of operating conditions.

From an operating standpoint it is thought that the most desirable tonnage requirements for the new type of mill will lie between 50,000 and 75,000 tons per year. With the addition of more welding units, the production may easily be raised to 125,000 tons.

Initial investment, maintenance and operating cost are so low that profitable operation under favorable circumstances may be maintained on a production as low as 15,000 tons per year, or even less.

Where sales possibilities come anywhere within the tonnage and size limits indicated, the new process approaches the ideal, especially for operators not producing their own steel plate.

Notable features of the new process are: Exceedingly low scrap loss and tooling cost; wide range of sizes which can be produced in the same mill, with one basic set of tooling; short set-up time for different sizes; small amount of operating skill required.

Biggest single consideration, however, for production within the limits mentioned, in most cases will be low initial investment in plant equipment—only a small fraction of that necessary with any of the older processes of pipe making.

Detailed information may be had for the asking. Your inquiries will receive prompt and careful attention.

Yoder Electric-Weld Tube Mills, now as in the past, under most conditions remain the most efficient and economical for sizes from $\frac{3}{8}$ " up to 12" outside diameter or larger.



THE YODER COMPANY

5510 WALWORTH AVE.

CLEVELAND 2, OHIO, U. S. A.

GLOBAL LETTER

REVIEW OF WORLD MARKETS



Government's wage-curbing policy backed by the Trades Union Congress . . . Brazil surveys its strategic mineral deposits . . . German steel output still climbing.

London—The Trades Union Congress, representing 8 million workers and known as the trade unionists' Parliament, has been conducting vital meetings at Bridlington, in Yorkshire. The Congress backed the government's wage-curbing policy by a substantial majority.

Some unions had resolutions pressing for price and profit reductions, but these were withdrawn after private talks. The general council made it plain that there was nothing more to be gained from the favored pastime of "soaking the rich", that business profits were now so cribbed, cabined and confined as to offer nothing more to the workers, that taxation was already far too high, that, in short, if the members wanted more money, they could only get it by working for it.

Policy Given Endorsement

To the union leaders' credit let it be said that this is not a case of horse sense only just percolating through thick skulls. They have known it for a long time, have paid lip service to it, but haven't always been so outspoken as they might have been when talking to their members.

Getting the government's policy endorsed by the Congress is no mean achievement. To cement their and the government's success, they need to go out and preach the gospel of increased productivity as the only salvation at the street corners and the factory gates. The Congress vote came within 24 hr of a warning given them by Prime Minister Atlee that increases of wages not matched by increases in production would gravely imperil the country's future.

Unions Support Policy

Miners, engineers, railwaymen and shop workers are among the unions backing the government. It is somewhat ironic that most of them have wage claims or adjustments pending. But they say that these are within the terms of the government's White Paper, which allows some claims for more pay.

The strong engineers' union decided at their conference this year to press for another \$4 a week. The National Union of Railwaymen are still awaiting the result of their \$2 a week all-round claim. The miners are also seeking higher pay to catch up with the others. The Transport and General Workers'

Union have some sections also demanding more money.

The General Council did not get through without some harsh words being said. But they won out, which is good for the government. No doubt it also made pleasant cabling news for Ernie and Sir Stafford.

Brazilian Mineral Output Gains in World Importance

Sao Paulo—The Brazilian Dept. of Mineral Production, the D.N.P.M., is increasing its activities. Wartime arrangements have been resumed with the United States Geological Survey and Bureau of Mines to investigate problems of interest to both countries. In addition to American technical assistance the D.N.P.M. has engaged the services of Professors Wilhelm Kegel, formerly Director of the Prussian Geological Service, and Hans Mojen, the German specialist in fuel and synthetic petroleum.

Two professors from Prague University are already at work in the laboratory, and invitations to join the department have been sent to one British, one Finnish and five German scientists, each a specialist in his own branch of geological or mineral research. With these reinforcements and adequate sums at its disposal the D.N.P.M., which has hitherto lacked both staff and funds, will be able to intensify examination of the Brazilian sub-soil.

Brazil possesses the biggest known deposits of zirconium and

Turn to Page 154

Why Ostriches make poor production men

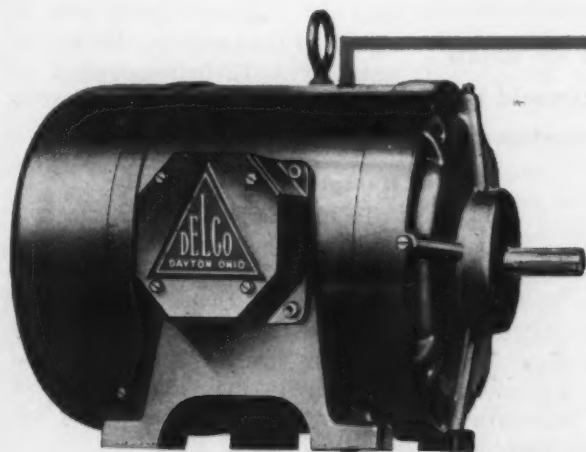
The trouble with sticking your neck out in the matter of slashing production costs is that you're likely to get a biased view of things.

Cutting corners indiscriminately, buying entirely on a price basis, continuing to put up with over-age and under-built motors . . . such a policy may lead to pennies saved but will surely lead to dollars lost.

Real production economies, on the other hand, are effected by production men who see to it that their plants have machines that keep production rolling...



machines that waste no time because of motor failures . . . machines that are powered by Delcos. There are integral and fractional motors by Delco that *lower* costs in the only way that really counts — by *raising* production efficiency.



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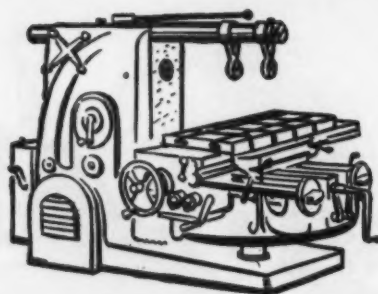


DELCO MOTORS

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SALES OFFICES: CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HARTFORD, CONN.

September 22, 1949



MACHINE TOOL

High Spots

SALES, INQUIRIES AND PRODUCTION

Cleveland—Major segments of the machine tool industry were viewing fourth quarter sales prospects with restrained optimism this week as September volume was tumbling below expectations and the predicted fall revival was still in the offing.

In Detroit the air is filled as usual with reports and rumors of new model cars, particularly so-called "light cars," but the rumors are vague and sometimes even contradictory. Running down a rumor concerning a new engine, for example, is sometimes exasperating and often disappointing. For example, rumors about a new high compression engine to be built by a major producer have been floating here for several weeks. The reports leave little doubt that the company will definitely build a new high compression engine. Investigation shows, however, that this particular producer has not one but as many as ten new engines, none of which has been given a green light for production.

Rumors of Light Cars

This is by way of saying that reports of new engines and cars flowing out of Detroit, as in the past, continue to outrun by a wide mar-



by

William A. Lloyd

September volume is far below expectations . . . McDonald denies production on phantom orders.

gin the tooling commitments to support such a program.

In Cleveland, L. D. McDonald, president, National Machine Tool Builders Assn., and a vice-president of Warner & Swasey Co., warned that recent rumors that "phantom" machine tool orders would be put in production now to aid employment in distressed areas are of unknown origin and completely without foundation.

In a release this week a Washington news service indicated the possibility of RFC financing to place these "phantom" orders in

production now, the machines to be added to the national stockpile for future needs.

No Phantom Orders

"There is no such thing as 'phantom' orders," Mr. McDonald stated in a letter to NMTBA members. "There are emergency production schedules which could be activated immediately in case of war.

"Doing so now would only aggravate the position of the machine tool industry by adding to the stockpile of government-owned machine tools. Furthermore, it would have little effect on employment, since it would take manufacturers from 6 to 12 months to build up the rate of operations called for by these production schedules.

"A far more constructive step would be the liberalization of present tax policies of the Bureau of Internal Revenue with respect to depreciation allowed on machine tools."

This, Mr. McDonald believes, would yield a backlog of orders that would stabilize employment in the industry and enable it to produce at a level guaranteeing the country adequate preparedness for national defense.

Also in Cleveland, 20 master mechanics from General Motors Plants spent a day this week studying the latest types of machine tools developed by National Acme Co. R. R. Rhodehammel, general sales manager at National Acme, was in charge of the program. He was assisted by A. E. Drissner, chief engineer, and C. W. Simpson, executive vice-president.

Hampering Productivity

In Philadelphia, Tell Berna, general manager of NMTBA, told members of the Philadelphia Chapter of ASTE that two misconceptions, one by management and one by labor, are hampering potential productivity and adding to the cost of many products bought by the public.

Speaking before a regional meeting at Hotel Broadwood, Mr. Berna said too many men in management assume that American industry, on the whole, is marvelously equipped.

"This is due to the misconception that because a machine is still in good running order it is still a good machine.

...and tricky ones, too



- you need this improved

MACHINABILITY

Regardless of the design of steel parts made on a mass production basis, your spread between profit and loss is determined in most part by the MACHINABILITY of the steel bars you use.

That makes MACHINABILITY vitally important—so important that Union Drawn has spent large sums in improving it to the present high levels found today in Union Cold Drawn Steels.

For 60 years, Union Drawn Metallurgists and Engineers have been making an intensive study of the machining characteristics of various steels. They have learned much—particularly how slight changes in chemistry and processing produce marked effects on speeds and feeds, tool life and machined surfaces. Each year they cut up tons of steel on an "automatic"—and spend long hours in customers' plants observing the performance of steels under actual operating conditions.

The results: (1) an unequalled knowledge of MACHINABILITY; (2) the development of new free-machining steels; (3) a continuous improvement in all Union Drawn Products from year to year.

Whether you make simple steel parts—or tricky ones—why not take advantage of the improved MACHINABILITY in Republic Union Drawn Bessemer, carbon, alloy and stainless steels—plus Union Drawn's metallurgical and engineering assistance? They can mean higher production efficiency, increased output, lower unit costs and better surface quality. And remember, too, that all types of furnace treatment are available to further improve your profit picture.

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Union Cold Drawn and Ground Rounds; Turned and Polished Rounds;
and Turned, Ground and Polished Rounds (Union Precision Shafting.)

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PUBLICATIONS

Permanent Molding

Facilities for permanent molding of aluminum bronze and other non-ferrous alloys are described in 8-p bulletin. *Non-Ferrous Div., Buffalo Pipe & Foundry Corp.* For more information, check No. 1 on the postcard.

Furnace Service

Maintenance service for furnaces and a list of furnace materials available from stock are featured in 6-p bulletin. *Laclede-Christy Co.* For more information, check No. 2 on the postcard.

Temperature Controls

Catalog No. 14 describes and gives engineering data and price list of temperature controls, relays and thermometers for laboratory and industrial uses. *H-B Instrument Co.* For more information, check No. 3 on the postcard.

Stencill Etching

Equipment for electrolytic stencil etching for marking metal parts is described in 4-p illustrated bulletin. *Lectroetch Co.* For more information, check No. 4 on the postcard.

Hoppers and Chutes

Bulletins give information, specifications and prices on equipment designed to keep pulverized materials, which tend to pack, flowing readily from bins, hoppers and chutes. *Bin-Dicator Co.* For more information, check No. 5 on the postcard.

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

Hobbing Equipment

Hobbing machines, hob sharpening machines, hobs, milling cutters and reamers are described in 24-p catalog, which includes specifications and explanation of hobbing process. *Barber-Colman Co.* For more information, check No. 6 on the postcard.

Dust Control

Dust control systems, equipment, filters, machinery and accessories are featured in bulletin No. 98. Included are illustrations of dust control installations. *W. W. Sly Mfg. Co.* For more information, check No. 7 on the postcard.

Solid Metal Screens

One-piece, solid metal screens, made by electroforming and featuring uniformity and accuracy, are described in 4-p bulletin. Mesh counts of from 25 to 400 in thicknesses from 0.0005 to 0.012 in. are available. Special sizes can be made. *C. O. Jelliff Mfg. Co.* For more information, check No. 8 on the postcard.

Cutting Fluids

Report No. 749 describes results from use of cutting fluid in machining 600 lb forged steel valve

bonnet. Advantages listed include increased tool life, increased production rate and reduced costs. *F. E. Anderson Oil Co.* For more information, check No. 9 on the postcard.

Chucking Machines

Described in bulletin No. CM-43B are 4, 6 and 8 spindle chucking machines. Features of design, construction and operation, as well as dimensional drawings, are given. *National Acme Co.* For more information, check No. 10 on the postcard.

Abrasive Products

Abrasive products for the stone industry, their features and uses are described in booklet. Included are specifications, feed speeds and operating instructions. *Norton Co.* For more information, check No. 11 on the postcard.

Boring-Milling Machine

A machine for precision boring and milling is described in 20-p bulletin. Specifications, features of design and construction and accessory list are given. *DeVlieg Machine Co.* For more information, check No. 12 on the postcard.

Turn to Page 118

Another cost-saving advantage of
**B & W
MECHANICAL
TUBING**

DIMENSIONAL ACCURACY

... that cuts
machining and
fabricating time,
reduces scrap-loss; speeds
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You have a wide choice of B&W MECHANICAL TUBING

TYPES Seamless (hot finished and cold drawn).
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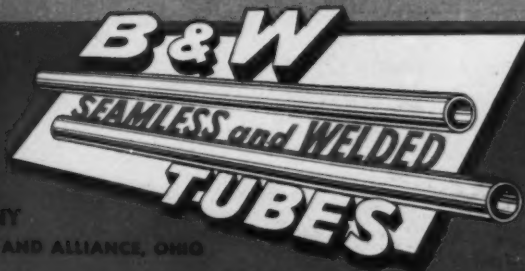
GRADES Carbon, Alloy, and Stainless.

SIZES Up to 8½" O.D. in full range of wall thick-
nesses.

QUALITY Open-hearth, and electric furnace steels, in-
cluding aircraft and magnetflux qualities.

CONDITION Unannealed, annealed, tempered, normalized,
or otherwise heat-treated as required.

SURFACE As rolled, as drawn, as welded, bead re-
FINISHES moved, turned, scale-free, and polished.



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NEW

PRODUCTION IDEAS

Continued

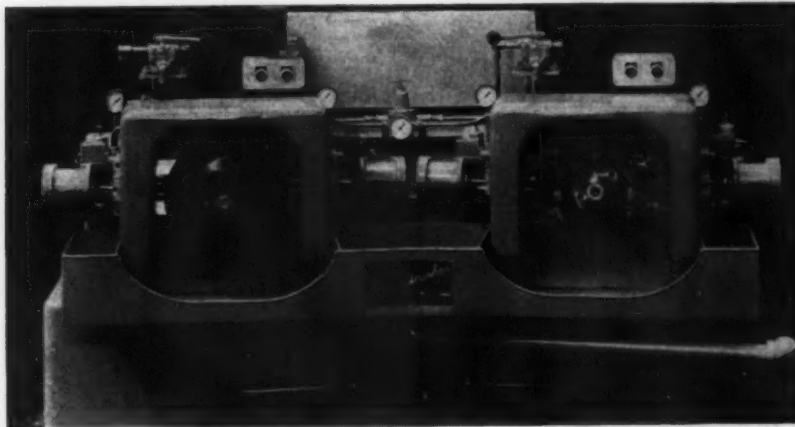
Numerals do not wash or wear off, or become discolored with age and there is no limit on the number of different numerals available. An all-metal carrier-dispenser holds ten 300-ft reels of wire. *Midwest Automatic Control Co. For more information, check No. 32 on the postcard on p. 37.*

Knife Grinder

A new, heavy duty straight knife grinder 28 ft long, for end to end precision grinding, handles heavy knives and blades up to 220 in. long. Model 220 is equipped with a 15 hp motor to handle the 20 in. segmental grinding wheel and a 3 hp motor to guide the traverse carriage. Five inch wide V ways in the base and carriage absorb grinding pressures and permit heavy cuts and fast feeds without vibration. Heavily slotted knife bars are 10 in. wide. This model is also available in 90, 100, 110 and 134 in. sizes. *Samuel C. Rogers & Co. For more information, check No. 33 on the postcard on p. 37.*

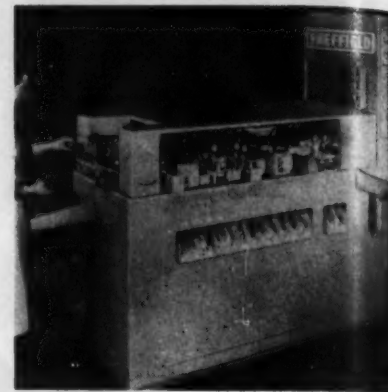
Brake Drum Superfinisher

Automotive type brake drums turned to a surface roughness of approximately 150 microinches rms can be superfinished down to 30-40 microinches rms on a new two-station machine. Spindles and controls are independent of each other. Each work station consists of a simple arbor and two sets of stones.



Gaging Machine

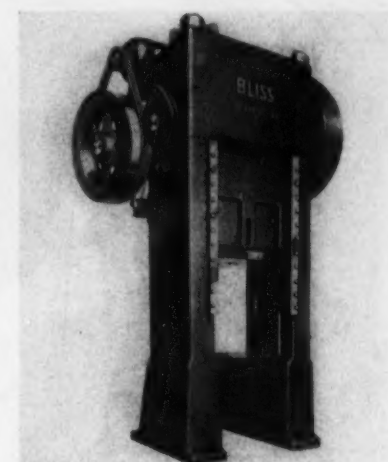
For automatically checking critical dimensions of an automotive valve tappet and segregating the acceptable, rejected, and salvageable parts, a machine has been developed with a cycle capacity of 2000 parts per hr. It consists of one loading station, five gaging, five segregating, and two unloading stations. Parts are moved through the machine by a walking beam that lifts and carries them progressively throughout a series of tungsten carbide-faced V's. Protective switches stop the machine in case of a jam, and a red light on the panel shows its location. A snap gage prevents excessively oversized parts from entering. Included in the various gaging operations are the outside diameters at each end and taper and the major internal diameter depth of major and smallest internal diameters. The solid end face is checked for squareness with the bore, and overall length is gaged. Unacceptable parts are ejected in separate chutes



after being classified as complete rejects or suitable for salvage and reworking. *Sheffield Corp. For more information, check No. 35 on the postcard on p. 37.*

Presses

New lines of straight side single and double crank presses conform to the recently established standards of the Joint Industry Conference. Tonnage and weight capaci-



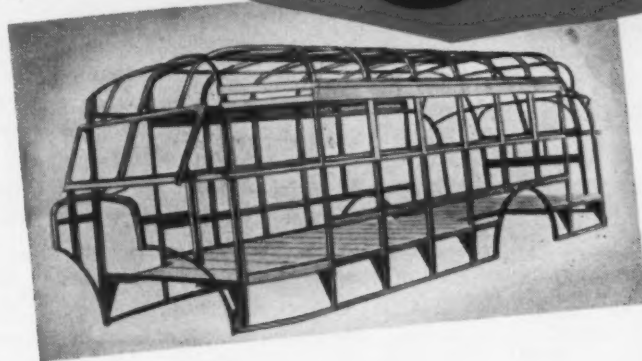
ties and bed and slide areas are slightly larger. A practical enclosure of working parts retains the advantages of accessibility and adjustment. Box type crowns and slides are reinforced by deep internal ribs. A barrel type slide permits long adjustment to accommodate dies varying greatly in height. All press frames are of the four piece tie rod construction, made of Meehanite castings. Slides and gibs are longer for precision guiding of the die into the work, slides remaining within the gibs at any position of stroke or adjustment. Single end drive presses with capacities up to 250 tons have a new type pneumatic friction clutch

Turn to Page 122

FRAMED and COVERED with safety



Pictures courtesy of Oneida Products Corp.



The greater strength and toughness of N-A-X HIGH-TENSILE steel permits weight savings of up to 25% in section—and still affords maximum protection against injuries from traffic accidents.

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On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Nash's basic body stampings remain unchanged . . . Nash adopts GM's Hydra-Matic . . . Ford labor settlement may follow pattern recommended by steel fact-finding board.



by

Walter G. Pottor

Detroit—Basic body stampings in the 1950 Nash introduced this week are unchanged. However, in addition to the adoption of GM's Hydra-Matic, a number of interesting engineering refinements have been made in the new cars.

Two lines of cars are offered as heretofore: the Statesman replaces the "600" series and the Nash Ambassador is now available with an automatic transmission. Both cars offer overdrive as optional equipment.

Exterior changes are more noticeable at the rear of the car. The top die has been extensively reworked to produce a rear window that is 10 in. wider. Bumper guards are heavier. The gas tank filler is now enclosed and the chrome belt molding has been removed from the trunk lid. Doors now swing open

at nearly right angles to the car body.

Some interesting changes have been made in the instrument panel and driving mechanism. Radio and driving controls used only occasionally are grouped together near the center of the panel and are now concealed under a sliding cover, reminiscent of a roll top desk. This will effectively prevent a parking lot attendant from listening to the football game on your radio.

The glove box located in the center of the panel has become a bin that is easily accessible to the driver. This receptacle has been increased in size. The clock is mounted directly above the radio and driving controls.

"Weather Eye" Is Simplified

Nash has also made some important changes in its "Weather Eye." The heater control has been simplified. Only one knob is used — in comparison with three or more used in some other cars. When the knob is rotated the defroster and heater fans are turned on. The knob may also be moved in or out to adjust the thermostat. Dual blowers instead of a single fan are specified on the new models.

A particularly interesting innovation of the new cars is a reclining right front seat, adjustable to

three positions in addition to the normal driving and bed positions. All standard Nash front seats on 1950 models will be of the split type.

Mechanical changes include the use of new type lower oil control rings to improve cylinder life and reduce oil consumption. The new "Seal-Flex" rings are made of SAE 1095. The oil wiping surface of the rings is formed by continuous U-sections containing tiny 1/1000 in. slots which meter oil to the upper cylinder walls. These rings were developed by Thompson Products Co. several years ago and are also used by Buick. Nash engineers have predicted that useful road life of an engine may be increased 50 pct with the new rings.

By using a "straight-through" type muffler without baffles, Nash claims greater useful power at high speeds, lower exhaust valve temperatures and less radiation by the muffler to surrounding parts. The heat shield between the muffler and the body has been removed.

Boosts Compression Ratio

Nash has also changed its battery mounting and has installed a heat shield between the exhaust pipe and the battery case on the Ambassador. The cylinder head has been redesigned to increase the compression ratio from 7.0 to 1 to

P&W

CARBIDE GO AND NOT GO DUALOCK ADJUSTABLE Thread Ring Gages



ADJUSTABLE —
RELIEVED AT
MAJOR DIAMETER —
CONVOLUTED —
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These long-wearing Pratt & Whitney Carbide Dualock Thread Ring Gages are especially suited for *dependable* checking of external threads on both long- and short-run work, whether used at the machine or at the inspection bench. Retaining the precisely lapped thread form for unusually long periods — these carbide ring gages result in substantial savings in gage costs and eliminate the ultimate scrapping of parts passed by steel ring gages worn "bellmouth" or "off-angle". Even on short runs, the saving in scrap cost alone often more than equals the extra cost of these P&W Carbide Dualock Thread Ring Gages.

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ST. LOUIS	725 Central Terminal Bldg.
SAN FRANCISCO	1331 Howard Street

7.3 to 1. H.P. rating for the Ambassador engine is 115.

Valve stems are harder on the 1950 models as a result of increasing the carbon content and changing the heat treatment. It is expected the new valves will resist scoring much more effectively.

Lightening holes have been eliminated from the crankshaft which is now solid. The new design is more rigid and eliminates the need for inserted tubes to carry oil from the main bearings to the connecting rods. Where Hydra-Matic is specified, the flywheel forms part of housing for the fluid coupling.

Eliminates Starter Button

Throttle and gear shift linkages for the Nash Hydra-Matic are somewhat different from the Olds and Pontiac design. The starter on Nash cars equipped with Hydra-Matic is actuated merely by lifting the selector lever. This eliminates the need for a panel-mounted push button.

The 1950 Ambassador will have a new camshaft featuring a new cam contour. A vertical tube radiator is used in the Ambassador, replacing a cross flow type.

Nash has modified its earlier Uniscope shroud to give more clear-

ance for service work and to accommodate the new transmission. The spare tire mounting has also been revised.

Ford Uses HF Heating

Ford has successfully applied high frequency heating to reduce the fabrication time of frames and pillars of its station wagons.

In the Ford process, a package of resin-coated wood plys is placed in a press between two metal electrodes. Voltages as high as three or four thousand are applied together with hydraulic pressure of 300 psi.

Ford engineers claim the following advantages for the process: (1) Laminated pillars save wood, (2) they are much stronger than the old lock-joint assembly, (3) dimensional stabilization, (4) improved appearance, (5) substantial reduction in production time.

Ford Labor Settlement May Follow Pattern of Steel Board

Predictions of a Ford labor settlement patterned after the recommendations of the steel fact finding board have become more insistent this week as negotiators went into session for the fifth con-

secutive day. Negotiations were held both on Saturday and Sunday last week for the first time since bargaining began more than three and one half months ago. Both Mr. Reuther and Mr. Bugas attended all of the sessions.

Some reports indicated the union was holding out for a Ford pension grant valued at 9¢ per hr. The original Ford pension demands were valued at 22 to 27¢ per hr. The entire union "wage package" totaled 45¢.

Ford is currently paying half of the cost of its employees group life insurance, the company contribution has been valued at \$1.25. Under the terms of the steel board report this would be deducted from the "wage package."

There is only the broadest speculation as to Ford's willingness to pay the entire costs of the Ford pension plan. In its previous pension offer to the union which was later rejected by Ford workers, Ford offered to pay \$180 million to start a pension plan for its employees. Under the previous plan, hourly rated workers were to pay 2½ pct of their earnings up to \$3000 and 5 pct above this figure. The retirement age under the earlier plan was 65 but workers could retire as early as 55. The first plan would have been administered entirely by the company.

Willys Plans Dealer Meeting

Toledo — Willys-Overland's new management is making an important change in its annual get-together to be held Oct. 7.

Big name bankers, financiers and industrialists no longer comprise the major portion of the guest list. Instead, Willys dealers and distributors from the 48 states will be guests of the company at its biggest dealer meeting in the past 20 years.

Salesmanship will be stressed at the October meeting. As a climax to the day's activities, a mass driveaway of 700 Willys-Overland cars will be staged.



BUICKS AROLLIN'
Although the new Buick Special was introduced a few weeks ago, production has already been pushed up to 800 units per day on this new model. Within the next week it is expected that 1200 Buick Specials per day will come off the GM assembly lines. This is the first picture of the new Buick Specials taken at the Flint plant.

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THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

Steel fact-finding board's report hailed as making a significant turn in labor-management relations . . . Britain's money talks end . . . No financial aid promised.



by

Eugene J. Hardy

Washington—Regardless of the outcome of the current dispute over social insurance and pensions for employees of the steel industry, the report of the President's steel fact-finding board is being widely hailed at marking what might be a significant turn in labor-management relations.

Officials in the federal departments concerned with labor matters are hopeful that the report will result in the end of White House interference in labor disputes. The board itself made it quite clear that this would be an extremely desirable outcome. Regarding the existing dispute, the board pointed out that there should be negotiations with individual steel companies to determine what deviations, if any, are necessary from the general recommendations relating to social insurance and pensions.

More generally, the board slapped at the prevailing system in the steel industry whereby the United Steelworkers would settle with the United States Steel Corp., and then proceed to cram this settlement down the throats of hundreds of small firms throughout the country. The report urged a return to in-

dividual company bargaining and stated that companies registering complaints about the current state of affairs were "quite justified" in doing so.

Labor Acted Too Quickly

But it is more from the standpoint of organized labor's own self-interest that it is believed the White House might finally be removed from the labor-management arena. Comments from some labor leaders about Phil Murray's quick acceptance of the report indicate that neither Mr. Murray nor other national labor leaders will be so anxious to run to the White House with their future troubles.

In addition to Mr. Murray being on the spot, because he has apparently lost a little ground in the labor race to see who can get the most, Mr. Truman may not be able to use the fact-finding report as a weapon in his campaign to repeal the Taft-Hartley Act. Initially, it had been felt that a peaceful settlement of the steel dispute as a result of Mr. Truman's extra-curricular fact finding activities would be a powerful campaign piece in the 1950 Congressional elections.

While much has been made of the board's rejection of the union's wage demands, the board has indirectly called for a wage boost, for there can be no denial that the recommended 10¢ an hr for noncontributory social insurance and pensions adds to the cost of doing business. The board estimates the added cost at 2½ pct. This estimate would pale into insignificance, however, once the noncontributory principle became well established.

Cost May Hinder Business

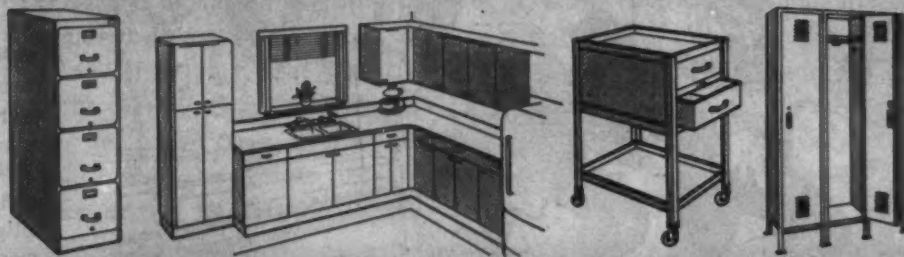
Of even greater import is the undeniable fact that once the principle of noncontributory social insurance was established in the steel industry, it would only be a matter of time before it became widespread throughout industry generally. Such a development, adding an ever pyramiding increase to the cost of doing business, would only serve to make it more difficult for an individual to start his own manufacturing business. All of this is, of course, in line with present Administration tax policies and serves to make somewhat of a mockery of the pro-

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- Revolving Bins

fessed bleeding-heart attitude regarding small business.

It would appear that the recommendations of Mr. Truman's board, while they still may settle the current dispute, may also have raised additional problems which the President will find rising up to plague him in the immediate years ahead. The first link in the chain that has bound up the Fair Deal and organized labor may have been broken. A new era in labor-management relations could be just around the corner and a general readjustment of the Administration's attitude toward the problems of business and industry might not be too much to hope for.

Britain's Money Problem Reviewed But Without U. S. Aid

Meetings between the finance and foreign ministers of England, the United States and Canada to study remedies for Britain's critical money problems came to an end last week with a plethora of promises.

As had been anticipated, however, the United States did not commit itself to any further extension of financial aid, except through avenues already open to the British, such as the Export-Import Bank.

As a jumping off point, the group accepted the fact that "extraordinary air" (or, in other words, the Marshall Plan) would have to come to an end by 1952. This means that the sterling areas must be prepared to pay their own way by that date.

Britain Devaluates Pound

Included among the steps to be taken by the United States, all of which have the objective of reducing the dissipation of Britain's dollar reserves, are: Authorization to redirect some Marshall Plan purchases away from the U. S.; liberalization of customs procedures; further reduction of tariffs; and encouragement for American investors overseas. The joint communique recognized, however, that these emergency steps represent no "permanent solution." They must

be accompanied by greater effort on the part of British industry economy in British governmental operations, and an effort to reduce costs all along the line.

Britain, followed by other sterling bloc nations, has already taken an important step in this direction—devaluation of the pound sterling. This will result in a reduction in the prices of Britain's goods which at the wholesale level have been about 25 pct higher than those in the U. S., thereby making it easier to sell British goods in this country.

However, some of the agreed upon U. S. promises may prove harder to fulfill than to make. The reason being that our own postwar planning has resulted in a few laws which may act as a brake in keeping such promises. For instance, the United States representative agreed to "review" the stockpiling program, particularly with respect to tin and rubber.

Opens Competitive Areas

They went even further out on the limb and told the British that this government is "prepared to open to natural rubber a substantial area of competition, including a modification of the government order relating to consumption of synthetic."

It is figured that such action could result in increasing British dollar credits in this country by at least \$50 million.

However, in order to make sure that synthetic plants may stay in business and keep up on research, Congress has provided for a minimum annual consumption of about 220,000 tons.

Rubber Consumption Drops

Liberalization of the regulations governing usage of rubber during the past year have already resulted in a substantial drop in the use of synthetics. The remaining leeway is slight.

Tin does not present quite the same difficulties and it is believed that, once price problems are ironed out, substantial additional quantities are likely to be purchased by the U. S.

THE BULL OF THE WOODS

By J. R. Williams



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WEST COAST PROGRESS REPORT



Purchasing agents want protection on steel prices . . . Quickie coal strike adds to worries of western steel producers.

Digest of Far West Industrial Activity



by

J. Reinhardt

San Francisco—A renewed buying low will possibly occur in the steel market in the event an industry strike is averted, according to A. B. Tietjen, manager of purchases, Southwest Welding & Mfg. Co. of Los Angeles.

Mr. Tietjen addressed approximately 300 purchasing agents from the western area last Friday at the fourth Pacific-Intermountain conference.

The speaker described the policy of the steel industry in selling on a basis of "price in effect at time of shipment" as being very distasteful to the buyer. He pointed out that in the present market a fabricator quoting a customer cannot protect himself in any way by an escalator clause. He said: "On projects requiring large tonnages the fabricator stands to lose considerable sums in case of a price advance for shipment. In discussing this point with many buyers, both fabricators and other manufacturers, it is strongly felt that the mills should revert to the policy of accepting identified tonnage at a firm price."

The purchasing agents were told that casting deliveries have

though some weakness is indicated.

In discussing the O'Mahoney Bill Mr. Tietjen said that the effect of this legislation on West Coast industries "will be difficult to determine." He added that the West is principally interested in the elimination of any phantom freight and expressed gratification that at least one of the largest producers in the West has established a base price at its plant which is the same as the base at all of its mills.

In conclusion Mr. Tietjen said: "I am sure that we who are responsible for the material cost in our companies feel that through competition all steel products rolled by western mills will ultimately carry a base price that is close to the eastern base of those products. This will give the manufacturers of the West the cost basis they need to serve the West and a fair chance to compete for projects in the West."

Western Producers Faced With A Quickie Coal Strike

Salt Lake City—Added to the worries of a potential steel strike at the end of this month, Western producers last Friday were faced with the annoyance of a quickie strike by the coal miners in the Utah-Wyoming district.

There was some confusion as to whether the miners walked out on their own accord as a result of dissatisfaction with their shortened work week or whether the strike was called by John L. Lewis directly. District union officials reported that the stop work movement was a purely local idea.

Geneva Steel Co. and Kaiser

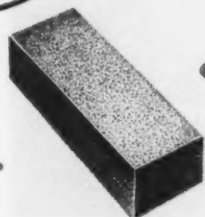
been materially affected by the current recession to the extent that where 6 or 8 months ago deliveries were on a 30-day schedule, a buyer can now secure almost any desired delivery to meet his requirements. Prices were reported as having remained stable except for occasional weakening and Mr. Tietjen expected but little possibility of a change in the near future.

Forge Shops Need Work

Forge shops were said to be in about the same position as the foundries with all of them looking for additional business. Prices reportedly have held fairly firm al-

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Steel Corp., both of which get the bulk of their coal for coking from the affected mines, report substantial supplies of coal on hand. Geneva could probably operate at its present rate for from 4 to 5 months and Kaiser Steel Corp. reportedly has a 6 day supply of coal at its Fontana, Calif. plant.

Geneva Steel Co.'s structural mill which has been closed for the past 2½ months because of a dearth of orders will probably get into operation again in October. A fair sized backlog of orders has accumulated but this is not believed to be large enough to assure continuous operation over too long a period. The expectation is that the mill will resume operations for several weeks on either a one or two turn basis.

Slump Hits Steel Business

Seattle—Northwest Steel Rolling Mills, back in operation after a protracted strike this summer, is finding business much harder to get than when the strike occurred. Some fair sized orders are forthcoming, but all for late winter or early-next-year delivery.

In this bracket falls an order for 8000 tons of reinforcing bars

for Unit 2 of the McNary Dam. Shipment on this contract won't start until early next year.

Bethlehem Pacific Coast Steel Corp. of Seattle is also falling off in production. This month finds the firm operating only two furnaces, with production not quite up to 50 pct.

This slump in business is, of course, having an effect on the scrap market. While the price has been going up back East, it is remaining firm here and the buyers are rather choosy about what they buy.

Plant Nears Completion

Salt Lake City—An expansion program at the Chicago Bridge & Iron Co.'s Salt Lake City plant is nearing completion. The company, which entered the local steel fabricating field less than 2 years ago, initially constructed a shop 125 by 300 ft, which was designed to fabricate ordinary flat bottom storage tanks, and an acetylene generating house. The current construction program includes a second shop 125 by 400 ft which is designed to handle elevated water tanks, spheres, spheroids and other highly specialized fab-

rication work; an outside runway 100 by 360 ft, a storeroom 80 by 100 ft; a two-story brick templet shop, 50 by 113 ft, and a two-story brick office building, 42 by 130 ft. These units have been completed except the templet shop and the office building.

The plant handles the fabricating work for the firm's contracts in the Intermountain and Pacific coast states, Alaska and Pacific islands.

The business of steel fabricators in this area is still holding up well. Backlogs are small and bidding is genuinely competitive.

W. S. Jack Builds Coast Plant

San Diego—William S. Jack, who won wartime fame for his "human engineering" production venture as head of Jack & Heintz Co. in Cleveland, is about to emerge from retirement, at least partially, to open a new plant in San Diego County.

Mr. Jack expects to have ready to open in October a 30,000 sq ft experimental laboratory plant to do research in supersonic instruments. He will employ about 500.

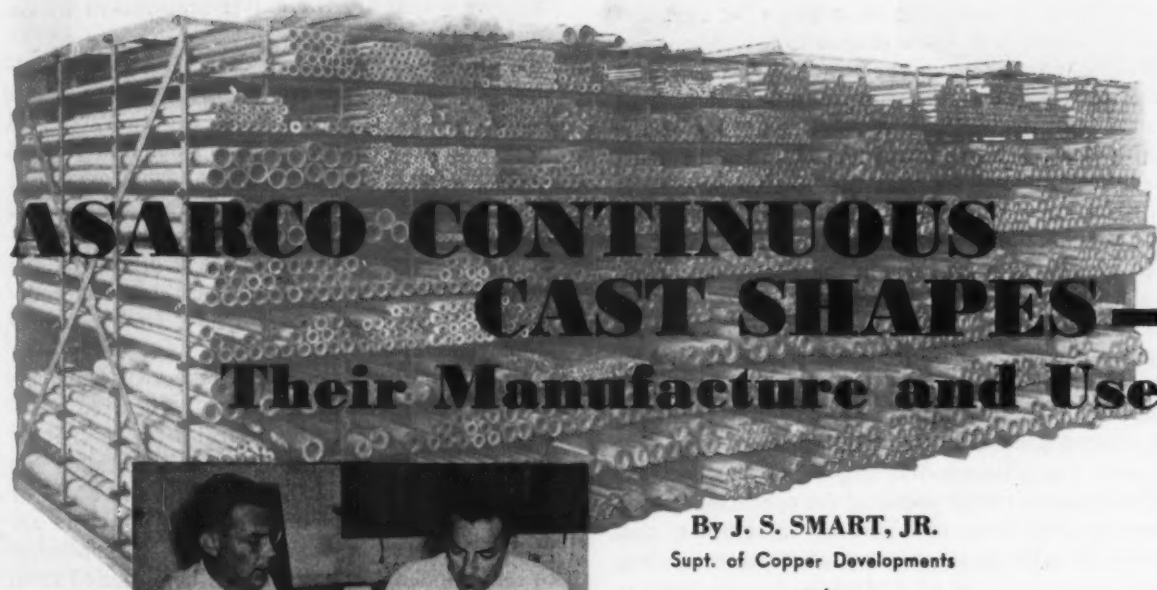
Still satisfied that his employee relations program pays off, Mr. Jack intends to follow the same program for employees here as in Cleveland. About 125 of his "associates" at the plant, which will be in Solana Beach 25 miles from San Diego, are heralded as top-notch specialists. Homes for about 20 of the key men are to be built on a heights subdivision overlooking the plant.

Mr. Jack does not intend to go into factory production here, sticking to prototypes of models for delivery to the U. S. armed forces.

Since leaving the Cleveland firm, he has been living in retirement at nearby Rancho Santa Fe. His "human engineering" paid off on construction of his home, which covers 7800 sq ft. After giving a turkey and \$100 to each building employe for Thanksgiving, he found he built in 57 days instead of an estimated 2 years.

READY FOR SPINNING: Looking east at the Tacoma Narrows Bridge site, the two completed towers are shown at the right. Work preliminary to spinning of the cables now is in progress. When this phase of construction is completed, Bethlehem Pacific, which is building the bridge, will send in crews to erect the main suspended structures.





By J. S. SMART, JR.

Supt. of Copper Developments

and

A. A. SMITH, JR.

General Supt., Research Dept.,
American Smelting & Refining Co.,
Barber, N. J.

SUMMARY: Details are given covering crucible construction, graphite die design, and cooling and casting techniques used with the Asarco process for continuously casting tin bronze alloys. This supplements data previously published in the issue of Aug. 26, 1948. The authors also discuss sizes, tolerances, properties and shapes (including tubular forms) in which metal can be cast by the process, and also cite varied uses to which such material has been put. Features which lend the process to production of job-lot quantities are also noted.

DURING the past few years the technology of continuous casting has advanced so rapidly beyond the stage of experimental demonstration that it is now firmly established as a primary production agency in the field of metal processing. Today, the bulk of all aluminum fabricating shapes, large tonnages of brass extrusion billets and cold rolling slabs, and important quantities of magnesium shapes, phosphorized copper billets, and oxygen-free wirebars are produced by a variety of processes. Further progress is to be expected from the several large development installations now actively investigating the continuous casting of steel and electrolytic copper shapes.

Since the majority of these processes have been designed to produce large tonnages of standard shapes for further processing, the average consumer of mill products normally expects to obtain his requirements from the huge variety of fabricated end products that eventually result from their use. Indeed, cost relationships are such at the present time that continuous casting of the ductile and easily worked metals is most properly applied to the initial or intermediate stages of the mill schedule.

This situation is greatly altered, however, if the alloys are not readily handled by the normal hot or cold working operations. In this field the Asarco Process,¹ by its very nature, has created

a new family of cast-to-size products in the form of finished mill lengths of rods, tubes, rectangles and special shapes in practically any of the standard foundry tin bronze alloys, including the lead, zinc, and nickel-bearing varieties. The commercial production of these shapes to a wide variety of dimensions, and in the job-lot quantities that the trade requires, is largely due to a number of basic features and the unusual flexibility of the equipment. These characteristics are of such practical importance that the Asarco process is the only method for continuous casting in present commercial use which produces finished stock for machining operations in the copper-base alloy field.

Fundamentally, the main requirements of all continuous processes are a reservoir of molten metal, means for introducing it into a mold at the required rate, suitable rapid cooling facilities to effect a practical rate of solidification, and provisions for uniform withdrawal of the casting. The total equipment required for operation varies considerably from one method to another, but normally adds up to an array of furnaces, molds, jackets, mechanical or hydraulic driving mechanisms, sawing equipment and, of course, the necessary rigid structures, cranes, controls, etc. However, it is readily apparent that in all processes the casting is actually formed by means of a water-cooled mold, and that all the rest of the equipment basically serves in an auxiliary role. Consequently, the design and cost of the mold and the method of its integration into the general scheme of operation will largely determine the permissible size range of the products, the possibilities of producing various shapes, and whether fairly small quantities of a given size can be cast economically.

For operations demanding the production of wide ranges of quantity and size, the employment of large metal molds integrally fastened into heavy water jackets is a decidedly cumbersome procedure, and the success of the Asarco process in this field is largely due to the use of relatively inexpensive graphite dies, typical examples of which are shown in fig. 1. High efficiency cooling is supplied by a separate jacket which has been carefully fitted to the die by means of a matching taper, as illustrated in fig. 2.

In use, the die is threaded into the bottom of a large graphite crucible (fig. 3) which is mounted in a heavily insulated nitrogen-filled furnace heated by graphite resistors to the desired temperature range. The jacket is then mounted on the die, and the die opening plugged from the bottom with a metal tip of the proper composition and size. Steel extension rods threaded to the tip pass through a double series of driving rolls located about 5 ft below the die.

The molten metal, prepared and alloyed in an adjacent Detroit arc furnace, is poured through the charge box and launder into the casting crucible, submerging the top of the die, and welding onto the starting tip. The rolls are set in motion and the solidified metal in the die is continuously withdrawn and continuously replenished by gravity feed from the contents of the crucible which are thereafter maintained within high and low limits.

As has been previously described,¹ the resulting products are free from porosity due to almost ideal freezing conditions and are characterized by very high tensile, yield, impact and fatigue properties resulting from the unusual degree of chill inherent in the process. In addition, the high degree of uniformity, with respect to physical and dimensional properties achieved by the continuity of the operation, has been especially gratifying to those users who have previously employed conventional castings.

Once a die has been put into service, the operation is continued until either the desired quantity is obtained or the useful life of the die completed, whereupon a new die is installed and casting continued. An average die life of 24 hr is considered satisfactory, but the die costs are reasonable, and it is often entirely economical to cast smaller lots than would be obtained from a 24-hr run. In any event, dies are not used a second time and facilities are provided for their daily manufacture.

All of the permanent equipment necessary to carry out the process has been standardized; the only expendable and specialty item is the die. Variety production is often simply a matter of machining the dies to the customer's desired dimensions, which is readily accomplished. The alloy to be cast and other factors important to successful operation will impose certain size limitations, with regard to wall thickness and rod diameter. Such effects have been largely evaluated by this time and a reasonable assessment of new items is normally possible.

This flexibility of operation, coupled with the close dimensional control and the unusual quality of the product, make the Asarco process an ideal method for the production of machining stock for the manufacture of bearings, bushings, and a wide variety of special parts. Since the customer may in addition specify the length, a very large proportion of all rods and tubes are furnished for screw machine operations in lengths of from 10 to 16 ft as required for economy.

Various parts made on automatics are illustrated in fig. 4, together with samples of the original cast stock. The bushings (75 Cu-5 Sn-20 Pb) are typical of the 60 or so such parts in the aircraft engines manufactured by the Wright Aeronautical Corp. Also illustrated is a valve guide made for the Wright engines by Aircraft Precision Products Co., Detroit, from 88/10/0/2

¹ See "Continuous Casting—The Asarco Process," THE IRON AGE, Aug. 26, 1948.



FIG. 1—Typical graphite rod dies are shown at left, illustrating the two standard die lengths employed to cover diameter range. Second from right is a tube die showing metal entry ports, while at far right is a multiple hole rod die for small diameter stock.

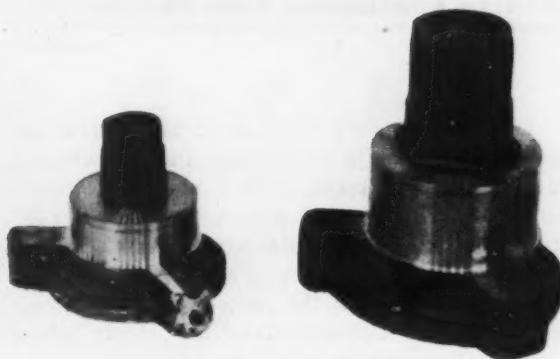


FIG. 2—Typical die and cooling jacket assemblies. Note threads for mounting the graphite dies in the furnace crucible.

tubing. The high fatigue properties of continuous cast shapes are especially valuable in such highly stressed applications, and Wright's engineers have specified their use for these bushings in order "to provide a stronger, more uniform material, more resistant to breakage in the non-supported, full-floating applications." The first 30,000 individual parts made from continuous cast bars were inspected at the Wood Ridge plant by black light for casting defects without a single rejection, after which this inspection operation was discontinued.

As might be expected, die design and die manufacture play an important role in both the successful operation of the process and the casting of special shapes. The simplest type of die is the single-hole rod design diagrammatically sketched

in fig. 5. It will be recalled that the top of the die projects up into the molten metal bath and in operation a very large temperature gradient exists downward from that point to the beginning of the jacketed portion. It is therefore imperative that some taper be provided in this section of the die to prevent bell-mouthing at the top due to thermal expansion. In practice, the amount of taper is varied with the alloy to be cast, and the use of compound tapers is also common to obtain optimum casting conditions. Such contours are made by boring on an engine lathe, except where small diameters are required, for which special taper ground reamers are more satisfactory. Dies having diameters from 7/16 to 2 in. are 6 in. long, while those for larger sizes up to 4 13/16 in. are 9 in. in length.

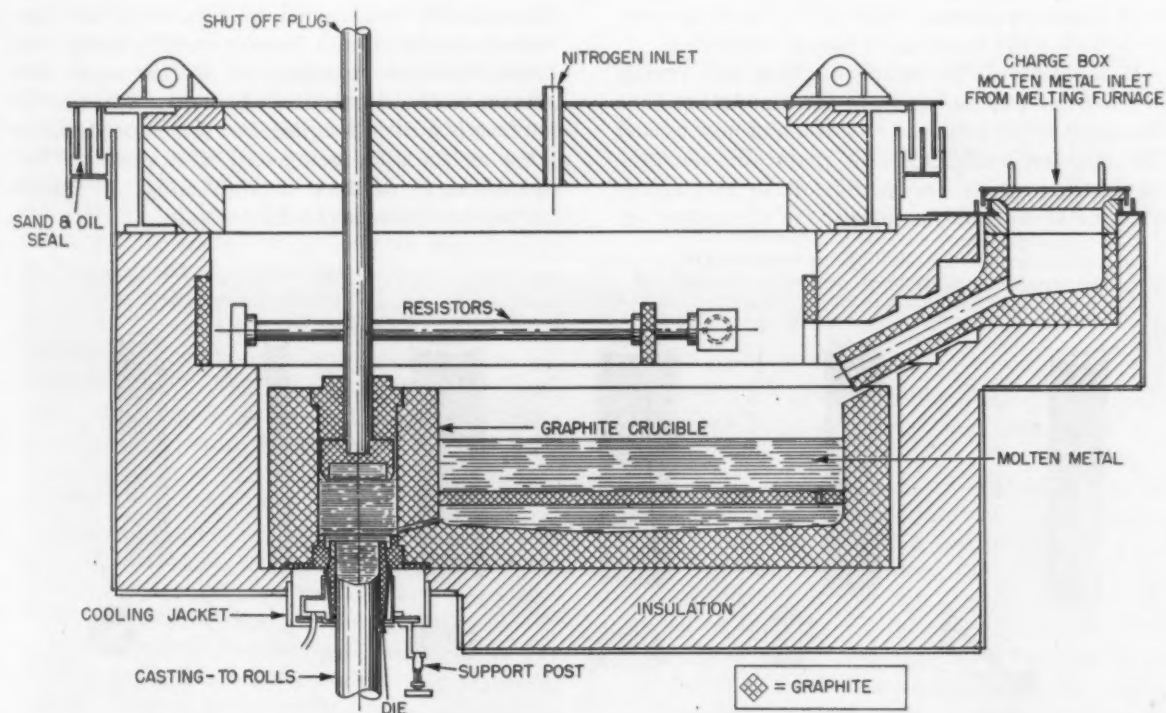


FIG. 3—Cross-section of casting furnace showing path of liquid metal from the main chamber into the die. The cooling jacket is held in position by three spring mounted support posts, one of which is shown.

During operation, the rate of heat extraction is so rapid that in some cases the temperature drop will approximate 2000°F along the length of the column of metal within the die. In fact, the major part of the total heat transfer, including all of the latent heat, is accomplished within a very short zone at the jacket line. These conditions insure a shallow freezing pattern where solidification shrinkage can be fed perfectly and from which the liberated gases escape continuously by diffusion.

The freezing mechanism thus closely approaches the casting ideal of placing and maintaining the gates and risers at the actual solidification interface which, with the attendant high degree of chill, constitutes an improvement in casting procedure that is effectively demonstrated by the high physical properties of the products. In fig. 6, which illustrates a variety of parts made from rod stock, the gears are particularly good examples of applications where the high yield strength of continuously cast bronzes are advantageous.

Among the important reasons for the use of graphite as a die material are its low cost, excellent machinability, high thermal conductivity, nonwetting properties, insolubility in copper base alloys, self-lubricating action, high resistance to thermal shock, and good strength characteristics at elevated temperatures. Every one of this unusual combination of properties is important to the successful operation of a tube die, such as that sketched in fig. 7, and in all probability no such simple two-piece construction would be possible with a die material of lesser attributes.

It is particularly significant that the vexing problems of how to lubricate the mandrel so that the casting will not weld or seize, and how to cool the mandrel sufficiently to maintain constant lubrication, which are so difficult to accomplish with metal dies and mandrels, are eliminated by

the use of graphite. Accordingly, the Asarco tube dies are constructed of two parts, structurally joined with great rigidity and accuracy, and cooled through the die wall by the same standard jackets previously mentioned. It is quite apparent that the jacket load is considerably smaller when casting tubes as compared with rods, since the graphite mandrel is replacing a volume of molten metal from which the latent heat would otherwise have to be extracted. Consequently, no additional cooling provisions are required for the mandrel.

As is shown in fig. 7, the OD of the tube is formed in what amounts to a rod die which must be equipped in its upper portion with at least a simple taper converging, in direction, to the top of the die. In operation, the solidifying and cooling metal shrinks away from this wall. On the other hand, the tube tends to shrink onto the mandrel, and here it is always necessary to use

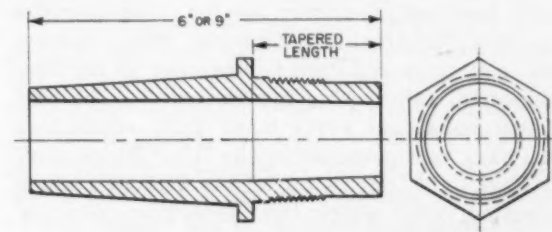


FIG. 5—Sketch of a rod die having a single taper at the top. Compound tapers are frequently used in both top and bottom sections, depending on alloy being cast.

an opposite taper of fairly generous proportions to overcome the tendency for seizure. However, the close fit of the inside surface of the tube to the mandrel maintained by this shrinkage pattern normally results in very smooth inside surfaces with the exception of a few small lead sweats in the highly leaded alloys. The outside surface is a little rougher, but this depends somewhat on the alloy being cast, and since the last operation is Medart straightening, a smooth burnished finish is the final result.

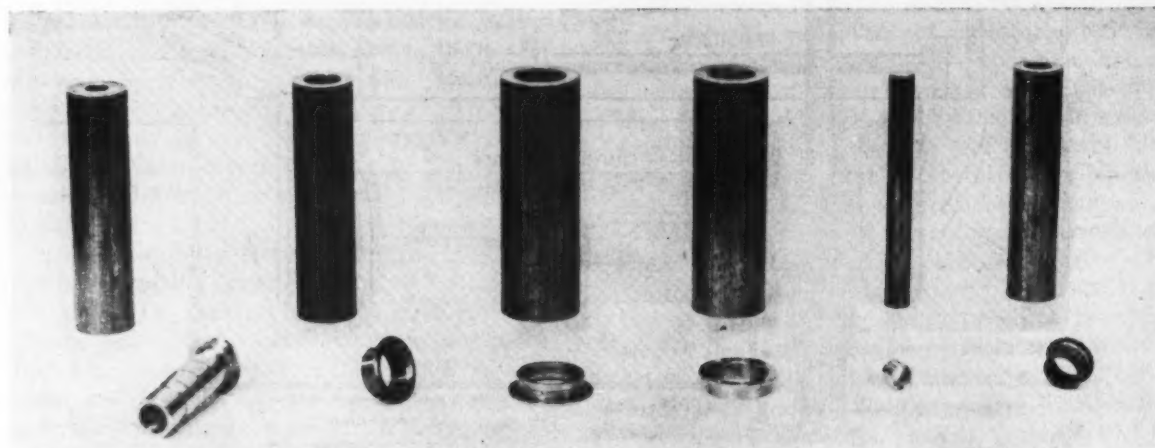


FIG. 4—Valve guide (left) and typical bushings for aircraft engines produced from continuously cast stock. Photo courtesy Wright Aeronautical Corp. and Aircraft Precision Products Co.

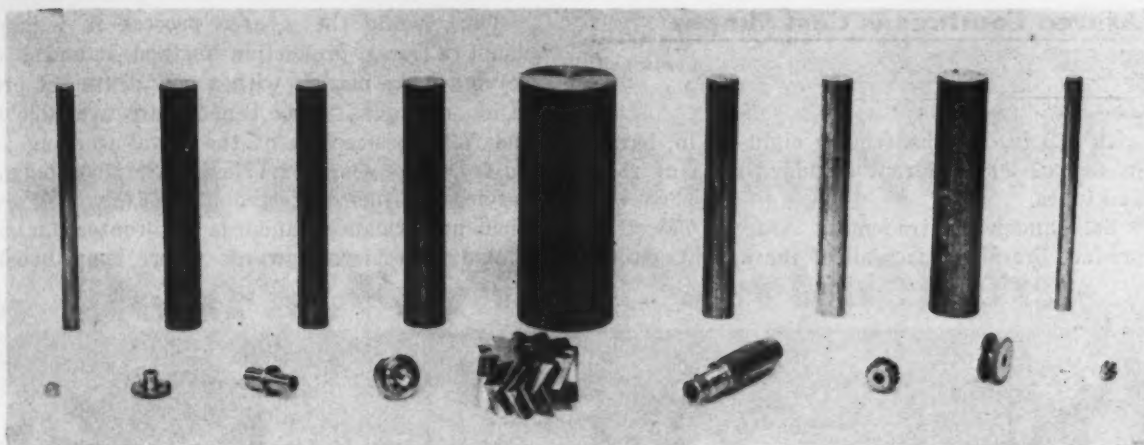


FIG. 6—Parts produced from rod stock in both leaded and nonlead bronze alloys ranging in tin content from 5 to 10 pct.

The Asarco process, as applied to seamless tube manufacture, is one of the very few in which the mandrel is truly rigid. Further, there is no problem of a mandrel adjustment as a part of the operation, since this has been predetermined with machine shop precision. Consequently, the concentricity of the product is normally within the limit of 1.5 pct of the wall thickness, maximum to minimum. Variation of wall thickness from the nominal is also well within the accepted commercial range, averaging about 2.5 pct in terms of reproducibility. At the present time, tubes ranging from 1 in. to 4 13/16 in. OD are being produced in a large variety of wall dimensions. As a general rule, the minimum wall of tubes exceeding 2 in. OD should approximate 10 pct of the diameter, with a 3/16 in. minimum for small sizes and a 1/2 in. minimum ID.

Due to their adaptability to automatic machining operations, freedom from casting defects, and the excellent dispersion of lead afforded in the popular bearing bronze alloys, Asarco-cast tubes are widely employed for bushings. The three larger parts illustrated in fig. 8 are piston and slide valve bushings used by Westinghouse Air Brake Co. In addition to uniform frictional properties, this application demands the ultimate in sound castings. Experience with continuous cast metal indicates that it is "superior in these respects to sand castings. Scrap losses have been practically eliminated, and longer tool life has been obtained." The inside surfaces of these parts will be finished after assembly operations, as will the outside of the small leaded bronze bushing which is pressed onto a brass piston to provide better wearing properties.

Since the process functions on a made-to-order basis, considerable leeway exists for the manufacture of special shapes, such as those illustrated in fig. 9. The practicability of such items will largely depend on the ability to machine the dies by methods which will incorporate the necessary tapers. The required modifications for casting such things as internal lugs are naturally quite simple, since the machining is performed on the

outside surface of the mandrel. It is considerably more difficult to place sharp cornered lugs on the outside of a tube, since this requires the slots (which are also tapered) to be cut on the inside surface of the die. However, by using tapered reamers, semi-circular lugs are obtainable, and these can be broached to the required shape.

The standard method of machining a rectangular or hexagonal die is by milling with a contoured cutter, which imposes the limitation of round corners. Recent developments, as yet incomplete, have permitted the square corners illustrated on the rectangular tube shown in fig. 9, and progress in this direction is continuing. In addition, no end of ingenious composite parts is

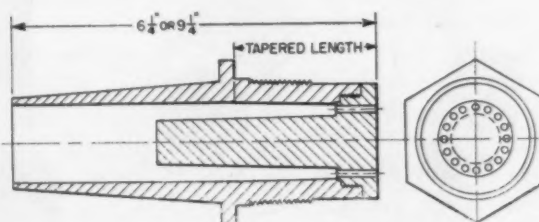


FIG. 7—Sketch of a tube die showing upwardly converging taper on die wall, downwardly converging taper on mandrel. Note method of providing a rigid assembly of the two parts and means for molten metal entry into the die.

possible, such as the included example of a washing machine gear made from continuous cast tubing and a die cast body.

Despite the versatility achieved in layout and operation, it is axiomatic that the Asarco process is not designed to cast a couple of this and a couple of that. Fortunately, the problem of supplying small quantities has been enormously simplified in the past few years by almost uniform adoption of 83/7/7/3 as a general purpose bronze for bearings, bushings, sleeves, gears, liners, etc. Consequently, warehouses carrying substantial stocks of this alloy, continuously cast in commercial quantities, can supply dealers from stock

Asarco Continuous Cast Shapes

Continued

with 105 in. lengths (equals eight 13 in. bars) in any of 205 different standard sizes of rods and tubes.

Sold under the trademark Asarcon 773, this product literally places all of the advantages of

Thus, while the Asarco process is without doubt a mass production method intended to serve a large market with a new degree of precision and quality, its benefits are available to the full cross-section of the metal working industry. Five years' experience in production and service have demonstrated conclusively that previous performance standards for bronzes can and should be revised upwards where continuously

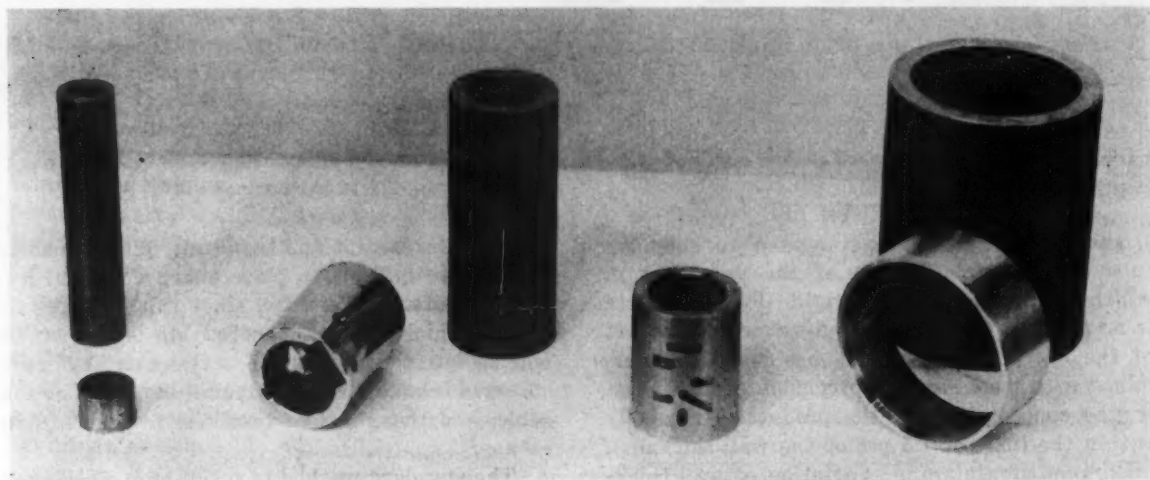


FIG. 8—Air brake parts machined from continuously cast leaded alloys. The two slide-valve bushings at the center must be free from porosity to avoid leakage. Photo courtesy Westinghouse Air Brake Co.

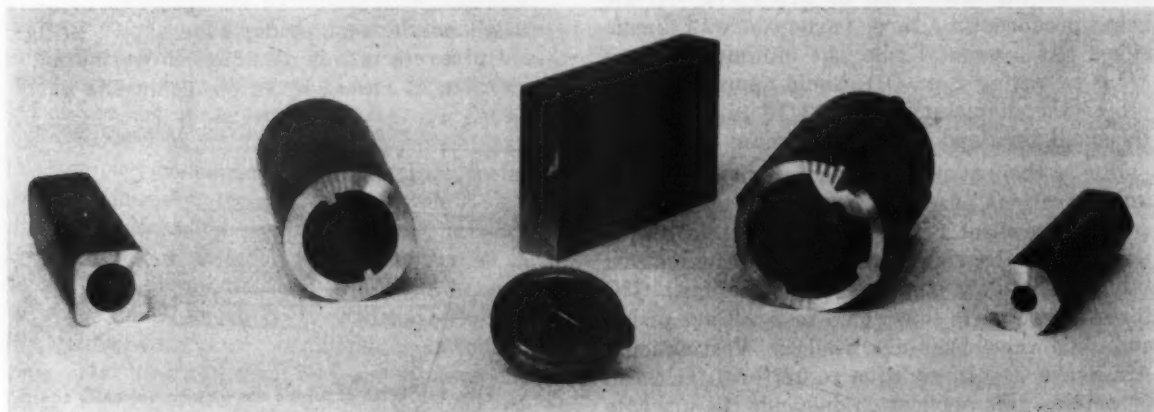


FIG. 9—A few examples of special shapes which may be continuously cast. Ability to machine the necessary contours into the dies is controlling factor in shapes which can be successfully cast.

the most modern of casting processes within easy reach of the smallest consumer. Peculiarly enough, the long lengths that permit automatic machining to the large establishment work an equal advantage to the man with one lathe; he can ask the dealer to cut off his measured requirements and buy only what he needs.

cast alloys are applied. For existing applications, both production and maintenance, better performance is assured at equal or lower cost. In addition, the design engineer will appreciate the future possibilities that always accompany the introduction of higher quality materials at competitive price levels.

INDUCTION STIRRING

in Electric Furnace Steelmaking

By E. S. Kopecki
Metallurgical Editor,
THE IRON AGE

SUMMARY: Economic, metallurgical and operational advantages are said to accrue from agitation of arc furnace heats by induction stirring. Construction features of an induction stirrer, which is attached outside the furnace shell, are described and results obtained through its use, in extensive steelmaking tests in Sweden, are related. An increase in annual production of as much as 20 pct is reported from use of a stirring unit.

A PROBLEM that has always confronted the steelmaker, in both the electric-arc furnace and the openhearth, is the difficulty in attaining an intimate contact and quick reaction between the steel bath and the slag.

Lengthy stirring by hand has been the only successful remedy and in the case of large electric furnaces two doors are required (at 90°) to allow the operator to reach the entire bath surface. Even in small electric furnaces, used mainly in high alloy steel production, repeated stirrings are carried out. Bigge¹ reports seven intensive stirrings employed in the production of high speed steel in a 7-ton arc furnace. In Europe the Asea dual frequency induction furnace, Rohn's eddy-current furnace, and the Perrin process have also been used as a means of thoroughly mixing slag and metal.

A completely different approach to the problem has been taken by Asea with the development of an induction stirrer^{2, 3, 4} which makes use of the electro-motor principle whereby a moving electromagnetic field is introduced into the hot metal to cause agitation. The method does not require rods or electrodes inside the furnace, and there is nothing to wear away and nothing to contaminate the melt, since the magnetic field itself is intangible and indestructible.

One year's operation of two induction stirrers, one at Hagfors and one at Surahammar, has revealed the following advantages:

(1) Economical—saving of time and increase

in output; also, to some extent a reduction of the prime costs of raw material.

(2) Metallurgical—improvement in quality and cleanliness of steel; quick homogeneity of the melt and a closer approach to equilibrium conditions; reliable analysis.

(3) Operational—significant improvement in slagging conditions; reliable temperature control and very rapid sampling.

In the middle 1930's there were two constructions that were intended to improve the metallurgical properties of the arc furnace. One, a German unit, was tested in practice at the Deutsch Edelstahlwerke in Krefeld. No details are known except those given by Rohland.⁵ The furnace effect was 1950 kva, with 750 kva on the arc side and 1200 kva on the low frequency

This article is based on papers presented at the Swedish Iron & Steel Institute meeting, May 28, 1949, in Stockholm, Sweden, by Ludwig Dreyfus, Folke Nilsson and Sven G. E. Fornander (see references 2, 3, and 4).

The induction stirrer is being marketed in this country by Aros Electric, Inc., 16 E. 71 Street, New York, Patent No. 2,256,518 applies and other patents are pending.—Ed.

stirring side. Results of the tests are very sketchy and are only concerned with desulfurizing and dephosphorizing of crude iron. Judging by the results, satisfactory stirring had been attained, but as nothing further has been heard about this furnace, it is believed that the low efficiency in the electric stirring effect made the

furnace too uneconomical to encourage further trials.

The second construction appeared in Sweden through cooperation between Asea and Surahammar. According to Dreyfus² a considerable difference in principle existed between the German construction and that developed by Asea. After a first installation in Surahammar had been tested in 1939, nothing further was done until 1943 when the Uddeholm Co. in Hagfors started to plan the building of a new electric steel plant with an arc furnace of about 15 tons. By reason of delayed deliveries the project was retarded and did not come into operation until the beginning of 1947. The stirrer did not go into operation until the fall of that year. Shortly thereafter Surahammar installed a new, somewhat smaller, furnace; there are therefore two induction stirrer installations at present in operation.

The Surahammar furnace (10 tons) is used in conjunction with a stirrer such as is illustrated in figs. 1 and 2. The enclosed stirrer in its final form and complete with converter, is shown in fig. 1. The motor of the converter unit draws 63 kw and drives two commutator generators which give a total effect of 105 kva to the two phases of the stirrer. Most of this is reactive power; the stirrer's losses in yoke and winding are only 40 kw. Heating effect generated in the melt is insignificant.

The stirrer, fig. 2, resembles a stator segment in a giant ac motor. The magnetic yoke is built up of laminated steel, 1 in. thick, but is bladed in the same manner as the yoke of an induc-

tion motor. Wide, deep slots house the heavy conductors that form the winding. Cooling is provided by forced air draught, which is also passed through a filter to remove dust and sand particles. A water-cooled yoke may also be employed on some designs. This stirrer is suspended directly from the furnace casing (see fig. 3) and thus follows all its movements.

The induction stirrer used with the 15-ton furnace at Hagfors is considerably larger. It uses 109 kw line effect and gives a total of 212 kva to the stirrer. The stirring force per unit of volume is 30 pct greater than in the 10-ton installation. This stirrer is water cooled, in addition to air cooling of the motor generator, also air injection between the stirrer and furnace bottom. As the weight of the stirrer is about 7 tons, allowance must be made in the construction of the turning mechanism for the furnace shell. It is of utmost importance that the temperature, both of the stirrer and of the furnace bottom, be continually controlled, because serious damage will result if the cooling water should be shut off by mistake. The Hagfors furnace is therefore fitted with an automatic alarm arrangement which acts if the bottom temperature rises above a certain point.

Theoretically, certain electrodynamic effects, causing a certain movement within the bath are said to be brought about in the conventional arc furnace, but, according to Dreyfus,² the magnitude of the forces involved is so small as to lack practical importance. On the other hand, Walter⁶ contends that the stirring produced in the Heroult furnace through the electric forces is the essential reason for the excellent results obtained with these furnaces in ore refining and production of high grade steel.

In spite of these conflicting opinions, most are

FIG. 1—Enclosed induction stirrer in its final form and complete with converter unit. This is the same induction stirrer as illustrated in Fig. 2.

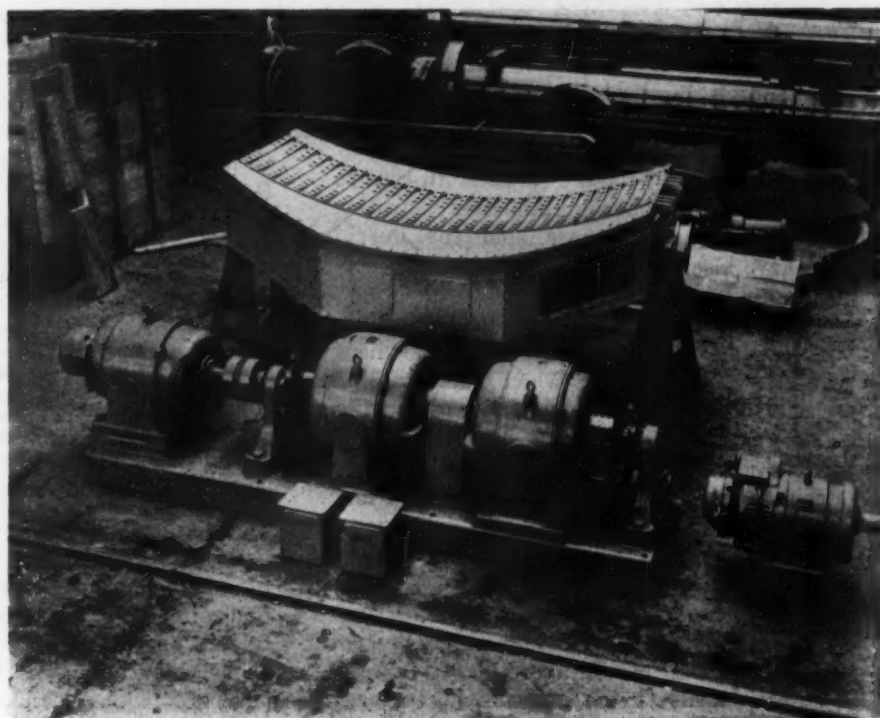
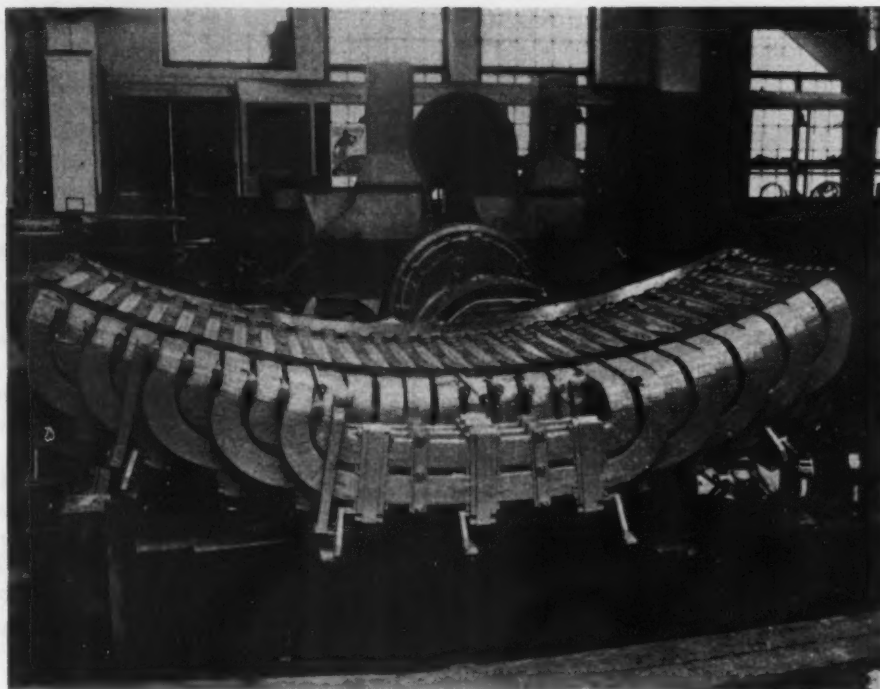


FIG. 2—Induction stirrer used in connection with the 10-ton arc furnace at Surahammar.



furnace steel men appreciate the need for more stirring than is provided by the electrodes and as in the case previously mentioned¹ conduct painstaking manual stirring operations.

Dreyfus² cautions that the melt must not be allowed to merely rotate around the furnace axis, because this type of laminar flow is not conducive to radial or vertical mixing of the different layers.

The Asea induction stirrer is said to overcome these deficiencies by driving the melt diametrically across the whole furnace bottom from one side to the other by means of tangential forces, and then, borne by its own kinetic energy, the melt will return in wide semicircles to the point where it began. The flow pattern for the Surahammar 10-ton furnace is shown in fig. 4. The first part of the diameter length D is then covered under acceleration and the second semicir-

cular distance under retardation. The desired mixing takes place when the melt, at the end of the straight-line distance, washes up, as it were, against the sloping side of the lining. At Hagfors the velocity of the return current at the surface of an uncovered melt was found to be about 2 fps at about 4 in. from the furnace wall lining.

It has been found expedient, both at Hagfors and Surahammar, to direct the bottom flow away from the charge door towards the pouring spout during slagging. This reverses the bath movement shown in fig. 4 and produces a surface flow as indicated in fig. 5. The acceleration distance now terminates at the spout, and the bottom current has become so strong at that point that it is pressed up towards the bath surface by its own force. Here it is forced to turn, the upward current forces aside the slag covering (when it

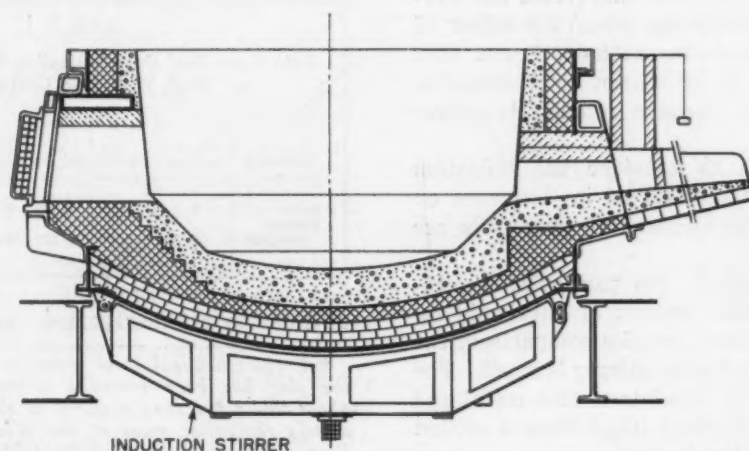


FIG. 3—Schematic diagram showing relationship of furnace and induction stirrer when in use.

becomes sufficiently thin) and a clear bath surface is formed. As soon as the rest of the slag covering has become detached from the furnace walls it is carried away by the two eddies and is continuously fed towards the calm "back-water" around the insert door within easy reach of the operator's rake.

If the bath movement is reversed now and then during the refining period, the mixing zone is moved from the spout to the door and back; this helps the thorough mixing of the melt and possibly also speeds up the slag reaction. If this should prove economically advantageous, it is

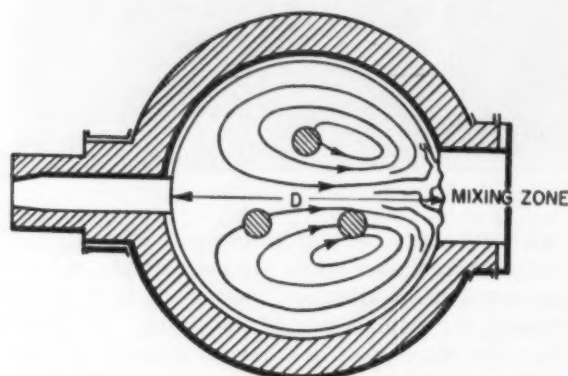


FIG. 4—The melt flow pattern for the Surahammar 10-ton arc furnace as developed by the induction stirrer.

possible to greater intensify the process by making the stirrer and furnace pot turnable in relation to each other. The furnace pot, in many European installations, is already turnable to an angle of $\pm 30^\circ$. If the stirrer is suspended in the cradle, instead of in the shell, and this be turned during the refining period, the mixing zone will traverse the same angle along the edge of the slag cover and detach it from the walls of the furnace pot. Instead of the furnace pot, the stirrer can be made turnable.

In practice it seems that the pattern of movement in the steel bath can vary from one furnace to another, depending upon the effect of the stirrer, lining thickness, bath depth, etc. Melt flow, as illustrated in fig. 4, can be produced in any type or size arc furnace by suitable stirrer design.

It is of interest to consider the induction stirrer from the standpoint of its influence on various stages of the steelmaking process in arc furnace practice:

Melting-down period. No particular significance, since a certain amount of energy is required to melt the steel, and by comparison, the power used by the induction stirrer is small. The stirrer is intended to circulate molten metal and would only begin to assert itself when a molten pool has formed in the furnace.

Oxidation period. Here at first the metal has

the assistance of the decarbonizing boil, which is a most efficient form of stirring. If, for some reason the boil stops, the stirrer undertakes the agitation of the bath, and it has been noticed on some occasions that this may be the means of restarting the boil. Decarbonizing rates are much accelerated by stirring at this time, when they would otherwise be at their lowest. It has also been shown that it is possible to obtain steels with a very low carbon content, simultaneously with a low oxygen content.

In the case of lower carbon contents when the boiling has practically stopped, the electrodynamic stirring does seem to influence the progress of the carbon reaction. Table I, which shows some data from the final stages of decarburization obtained during the production of low carbon steel at Surahammar, indicates that with electrodynamic stirring a low carbon content can be attained without the oxygen content being as high as would be the case if stirring were not used. Thus the stirring has the effect of allowing the carbon reaction to come closer to balance when the carbon content is low.

This effect has been realized in Surahammar, for example, where the carbon content of one grade of steel has dropped from an average of 0.045 pct to an average of 0.037 pct after the induction stirrer was installed. From table I it is also apparent that FeO content of the slag is lower when stirring is employed. The difference in FeO content is considerable, 10 pct, which means less iron loss.

Refining period. It is here that the effect of the stirring is particularly significant. The increased agitation of the metal produces a much more intimate contact between slag and metal. The active contact area is greatly increased and the chemical reactions proceed towards their equilibrium points more quickly.

Lowering of the oxygen is accelerated and more complete, and it has been found possible to make steels at Surahammar with a lower oxygen content than ever before. In fig. 6, which shows the changes in oxygen content of a steel bath*

TABLE I
Data From Final Decarbonization Stage in Production of Steel With Low Carbon Content

Stirring	No. of Charges	[C], Pct	[O], Pct	$\frac{[C]}{[O]}$	(FeO)	(FeO)
None.....	6	0.029	0.094	0.0028	46.2	0.0020
Electrodynamic..	5	0.031	0.071	0.0022	36.2	0.0020

during the refining period (each of the curves

* A constructional steel made at Surahammar. When the slag has been removed a quantity of aluminum, about 500 g per ton, is added to the clear bath. Immediately thereafter most of the silicon-manganese, burnt lime, fluorspar, pulverized ferrosilicon and coke breeze is added.

represents an average for two charges), the advantage of the stirrer in lowering more quickly the oxygen content of the bath is apparent. If it is intended to produce this type steel with a certain oxygen content before pouring, it is possible to reduce the refining time by 30 to 40 min by using the stirrer. In other types of steel, the saving in time has been even greater.

Sulfur removal is also accomplished in less time. A saving of 20 to 30 min is usual practice, and as much as an hour has been saved in special cases. Fig. 7 shows the changes in sulfur content of the above steel during the refining period.

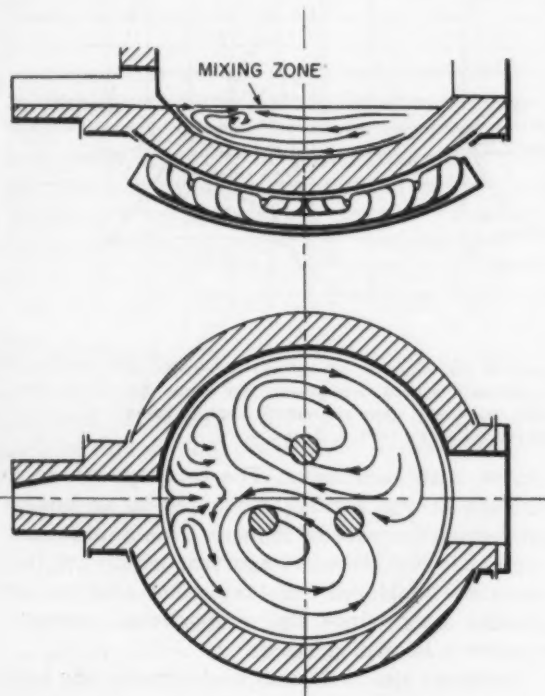


FIG. 5—Reversal of the bath movement during slagging operations produces the pattern shown.

Slagging. Slagging operations are greatly facilitated when the stirrer is in operation. The stirring effect is arranged to create a flow of surface metal towards the furnace door, and the slag is thus carried towards this door and pushed out while the hot metal scours the furnace walls where an operator could not reach conveniently with a rake. The ease of deslagging is of great help, especially in the processes that require more than two slags and it also makes it possible to handle the large slag volumes associated with the dephosphorization of low grade scrap.

In the production of one particular steel at Surahammar, where it has been desirable to remove impurities as completely as possible, the steel was earlier produced in a conventional arc furnace, the charge consisting of 50 pct commercial scrap. Three slag removals had to be carried out in order to effectively remove oxidizable impurities. The same quality is now produced, using the electric stirrer, from a

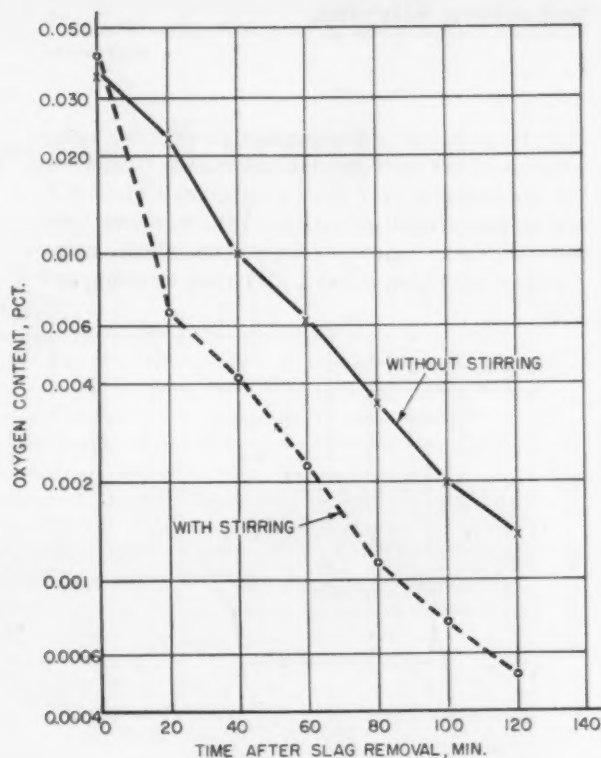


FIG. 6—Comparing deoxidation practice during refining period with and without induction stirrer.

charge consisting of 100 pct commercial scrap and only one slag removal is carried out. In spite of this, the amount of oxidizable impurities is in some cases as low as previously, and in some cases is lower.

Another interesting point noted with respect to effectiveness of the slag removal concerns composition of the slag during the refining period. In six charges run at Surahammar, in an older furnace without a stirrer, the average basicity of the refining slag was 2.2. In five charges run in the new furnace with stirring, on the other hand, the basicity was 3.0. Since lime and fluorspar additions were the same in both cases, the improved basicity is attributed to the more effective slag removal.

Comparative steelmaking tests conducted at

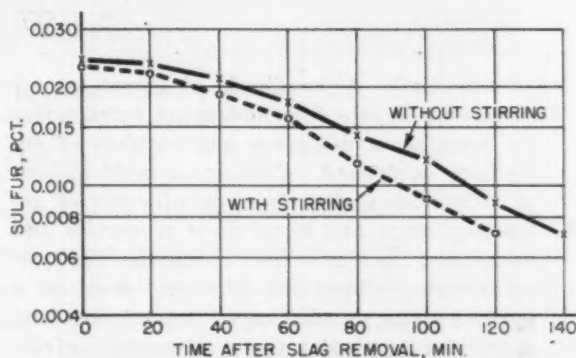


FIG. 7—Comparison of desulfurization during refining period with and without induction stirrer.

Induction Stirring

Continued

both Hagfors and Surahammar reveal that homogeneity of the melt is obtained in less time when the induction stirrer is employed than when raking is performed normally. Fig. 8 shows comparative tests conducted on carbon steels, using (A) the induction stirrer, (B) rake stirring, and

tributed evenly throughout the bath within a very short time after addition.

Temperature equalization in the bath is also obtained more quickly with use of the stirrer, making temperature control easier and eliminating local overheating.

Increases in production are also made possible by the electrodynamic stirrer. Not only does the stirring shorten the total time of the melt by some 10 to 15 pct, but it so increases the effective

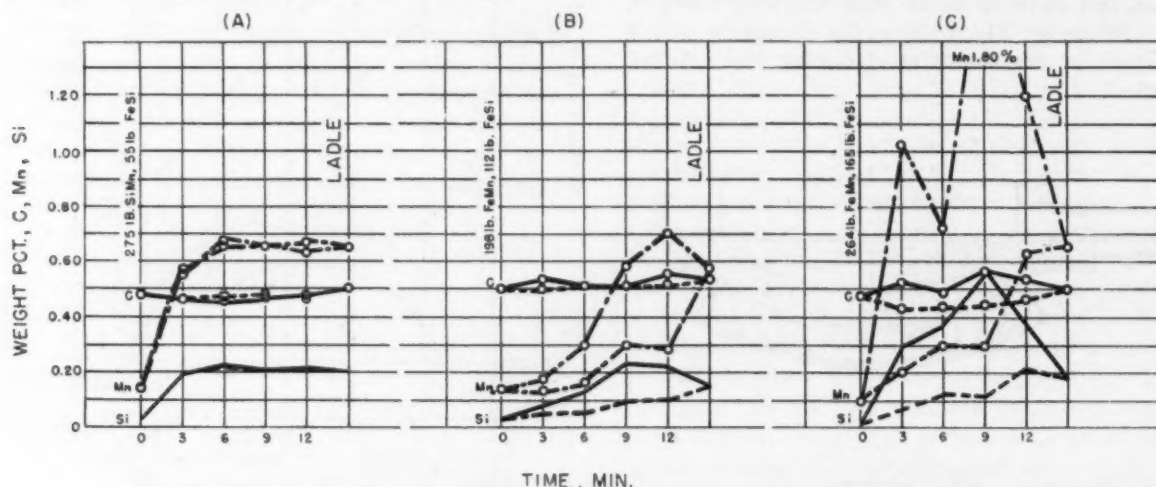


FIG. 8—Improved homogeneity in molten steel as a result of the induction stirrer (A) as compared with rake stirring (B), and no stirring (C). Upper curve for each carbon, manganese and silicon determination represents analysis at the metal surface, while the lower curve represents analysis taken near the furnace bottom. In (B) rake stirring was employed following tests 2, 3 and 4.

(C) no stirring. Analyses of the three heats are as follows: (A), 0.50 C, 0.20 Si and 0.65 Mn; (B), 0.53 C, 0.20 max Si and 0.55 Mn; (C), 0.50 C, 0.20 Si and 0.65 Mn. Note the wide variation in surface and bottom analysis values for the latter two procedures as compared with the stirrer.

Because of the quick homogeneity produced by the stirring, it is now a simple matter to sample the melt. The time required for sampling is 5 or 10 min less, and in some cases the saving in time is even more significant. Furthermore, the check analyses can be relied upon to represent the whole of the metal. In alloy steelmaking it has been shown that the alloying materials are dis-surface area of the bath that it now becomes possible to use a deeper bath and take a larger

charge with each melt. The total advantage so realized at one furnace amounted to an annual production increase of 20 pct. This gain in production is particularly important where arc furnaces are employed for taking hot charges for refining only, since the proportional improvement will be still greater.

Tests are also underway to determine the suitability of the induction stirring device to the openhearth furnace.

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- ² Ludwig Dreyfus, Asea, Vasteras, Sweden.
- ³ Folke Nilsson, Uddeholms AB, Hagfors Steel Works, Hagfors, Sweden.
- ⁴ Sven G. E. Fornander, Surahammars Bruks AB, Surahammar, Sweden.
- ⁵ W. Rohland, *Stahl und Eisen*, 61, 1941, part 1, p. 2.
- ⁶ F. Walter, *Elektrowarme*, 5, 1935, part 2, p. 25; part 3, p. 53; part 4, p. 86.

NEW BOOKS

"*Refractories.*" A handbook of complete, accurate, up-to-date information on refractories for consumers, designers and builders of refractory equipment. Contains a brief history of refractories, describes manufacture of refractory brick and gives their properties and behavior. Book also lists industries that use refractories, where and why, and provides a general guide to selection of refractories best suited for particular cases. General Refractories Co., 1520 Locust St., Philadelphia 2. \$5.00. 272 p.

"*How to Cut Production Costs,*" edited by H. E. Blank, Jr. Book is divided into three sections: Modern Production Methods; Production Techniques and Equipment; and Plant Maintenance, Services and Working Conditions. Techniques for reducing costs in plants, materials, controls, quality and inspection, fabrication, processing and research are cited. Included are check charts designed to reveal strong and weak points in existing plant operations. Funk & Wagnalls Co., 153 E. 24 St., New York 10. \$4.50. 371 p.

Muncie's Iron Lung

By D. I. BROWN

Chicago Regional Editor
The Iron Age

PRIOR to July 23, J. H. Reichart, president of Excel Mfg. Corp., Muncie, Ind., had never seen an iron lung. Yet three days later, Reichart, with the help of other local industrialists and a magazine article written in 1940, had produced an iron lung that worked. Their success in meeting the emergency, however, was largely due to a Ball Memorial Hospital nurse who had been saving 50 gal alcohol drums—just in case.

The story of Muncie's iron lung received international attention. Immediately the town was deluged with phone calls, wires, etc., as the polio epidemic mounted and the nation found itself short of the lifesaving mechanisms. Reichart and his co-workers built their model in 10 hr and immediately saw changes and improvements needed in their improvised lifesaver. The doctors asked for positive pressure as well as negative pressure, so the Muncie men designed and built a rotary valve. Although every effort was made to supply prints and specifications to other communities needing them, this became difficult as constant improvements were made on each succeeding model.

Although design is still not frozen, the details of Muncie's improved iron lung are presented herewith through the courtesy of the townsmen that developed the mechanism in this now famous community effort in which everything—material, labor and management was donated in their fight against the disease.

The main chamber was constructed of two clean 50-gal drums with smooth sides, not corrugated. Both ends were cut out of one barrel and one end out of the other. The open ends of the barrels were then welded together, see fig. 1,



FIG. 1—The first step in building the life saving iron lung was the welding together of two 50-gal drums.

SUMMARY: Two 50-gal drums welded together, a vacuum cleaner and an inventive metal plant executive helped meet Muncie's polio emergency by improvising a workable iron lung in 10 hr. Here is the story of the welding, the cutting, the drilling, and the fastening that went into making this iron lung.



FIG. 2—J. H. Reichart, the spark plug of the Muncie project fits the plywood bed into the improvised iron lung.

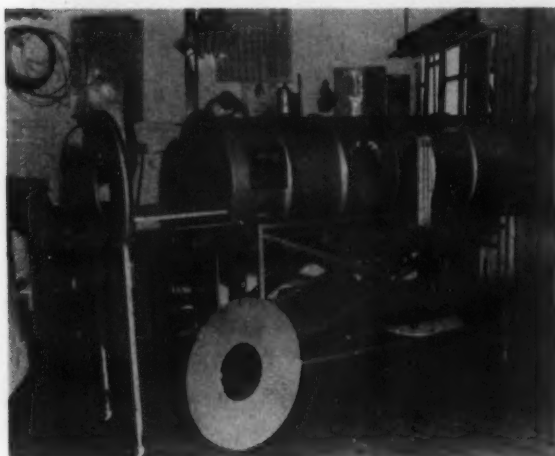


FIG. 3—The completed iron lung, including a home-made manometer. Note the vacuum cleaner mounted below the lung proper.

and four armholes, $4\frac{3}{4}$ in. diam, were cut out of the sides. Also two holes 4×7 for windows, one on each side, were cut out of the barrels. On one side of the rear barrel one hole 8×13 in. was cut to accommodate a bedpan.

Rails for the slide which accommodates a $\frac{3}{4} \times 18\frac{3}{4} \times 68$ in. plywood bed, shown in fig. 2, were welded inside the barrels from $\frac{1}{8} \times 1 \times 1$ in. angle iron. Three $\frac{1}{2}$ in. round rods, $\frac{1}{2}$ in. from each end and also one in the middle, were welded to support these rails. The head flange was made from a $\frac{3}{16}$ in. circular steel plate. This ring is 25 in. OD and $22\frac{1}{2}$ in. ID. Six holes of $\frac{5}{16}$ in. diam equally spaced around the outside edge of the thing were drilled. This ring was then welded into the front barrel $\frac{1}{4}$ in. from its end. This ring served as a flange and through the holes in it six $\frac{5}{16} \times 2$ in. round headed stove bolts were welded in place. To this flange face a $\frac{1}{2}$ in. thick by $\frac{3}{4}$ in. wide sponge rubber gasket was glued.

Sponge rubber was the one material that almost proved to be a disastrous bottleneck. The

Brown Rubber Co. of Lafayette, Ind., was the closest manufacturer. When Reichart, in charge of the project, called them they said they didn't have any stock but could make some in a week or 10 days. After the emergency was explained, the company phoned back in an hour and said they had chartered a plane that would have the sponge rubber at the Muncie airport by noon of that day.

Use Sponge Rubber Gaskets

Armhole frames were cut from $\frac{1}{16}$ in. sheet steel $7\frac{1}{2}$ in. sq with a $6\frac{1}{2}$ in. hole in the center. These were drilled for screws and sponge rubber gaskets mounted and the rubbers and frames were placed concentrically over the $4\frac{3}{4}$ in. holes previously cut in the barrel. Frames for the plexoglass windows were made in a similar fashion and the steel frames were drilled and bolted on the outside of the lung.

The bedpan hole door was made from a piece of $1/16 \times 11 \times 16$ in. sheet steel. The door gasket was of $\frac{1}{2}$ in. sponge rubber, 11×16 in., glued to the inside of the curved door which was attached with two hinges at the bottom and two thumb latches at the top. The end of the iron lung, through which the patient's head protrudes, was made from the circles of $\frac{1}{2}$ in. plywood 26 in. in diam with a $9\frac{1}{2}$ in. hole cut through the center. Six holes were drilled to fit the flange bolts and a circle of $\frac{1}{2}$ in. thick rubber of 20 in. diam with a 3 in. hole in the center was attached to this board. The inside hole of the rubber gasket fits around the patient's neck and between the aforementioned plywood discs, and the whole assembly is placed on the six stud bolts and held in place with $\frac{5}{16}$ in. wing nuts. This is shown in fig. 3. The assembly was placed on the stand shown in fig. 4 and a piece of $\frac{1}{2}$ in. plywood was bolted to the bottom angle iron rails to support the sweeper, valve, motor and speed regulator.

A 2 in. to 1 in. reducing bushing on a 2 in. pipe thread opening is fixed at the rear of the lung. Into this was screwed a 1 in. street ell and into the street ell a 1 in. close nipple. One end of the 1 in. coupling was bored to ring fit the metal end of the sweeper hose. The coupling is screwed onto the close nipple.

Vacuum Sweeper Mounting

A Sears, Roebuck Kenmore vacuum sweeper was screwed to the bottom board and it was found that three vacuum cleaner hoses were needed. One end of the sweeper hose in the vacuum end of the sweeper and the other end to the vacuum hole in the valve. One end of another hose was placed in the pressure end of the sweeper and the other end into the pressure hole of the valve. The third sweeper hose was connected to the top of the lung hole of the valve and the other end to the coupling on the lung. In most cases the vacuum is on two seconds and the pressure on one second, during the use or testing of the

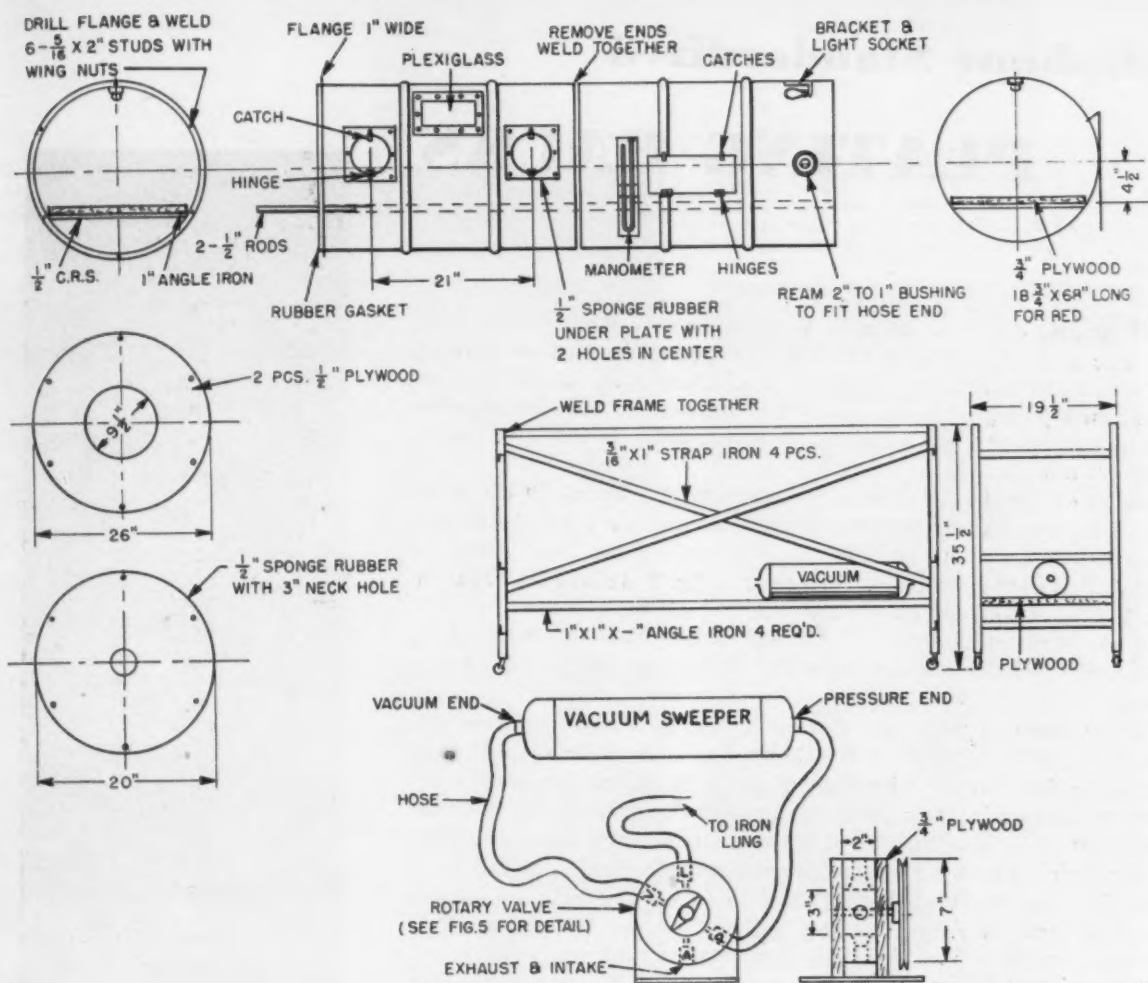


FIG. 4—Construction details of the improvised iron lung. See fig. 5 for details of the rotary valve. The manometer on the side of the lung was built of a 33 in. long piece of neon sign glass tubing and some rubber hose. The liquid was water, colored with mercurchrome. A numbered scale was worked out which gave either positive vacuum or pressure in both inches and centimeters.

mechanism. The manometer on the side of the lung (see fig. 3) was built of a 33 in. long piece of neon sign glass tubing and some rubber hose. The liquid was water colored with mercurchrome. A numbered scale was worked out which gave either positive vacuum or pressure in both inches and centimeters.

The rotary valve, used on later models, is shown in fig. 5.

Designers and builders of this emergency iron lung are offering the benefit of their experience to any who need it. J. H. Reichart has prepared a four page folder with the essential specifications for such a mechanism.

Another type lung can be operated with either a bellows driven by a 1/3 hp motor or can be run by hand operation. In a bellows lung the positive and negative pressure are regulated by adjusting two swing check valves. Should power fail on a bellows lung it can be operated by pulling the pin from a splice crankshaft, slipping the piece of 1 in. pipe hanging on the lower side rail, over the 1 in. by 5 in. stub and operated by pulling

the handle back and forth at the desired respiration speed. Mr. Reichart reported to THE IRON AGE that he will be glad to supply the descriptive folder to anyone.

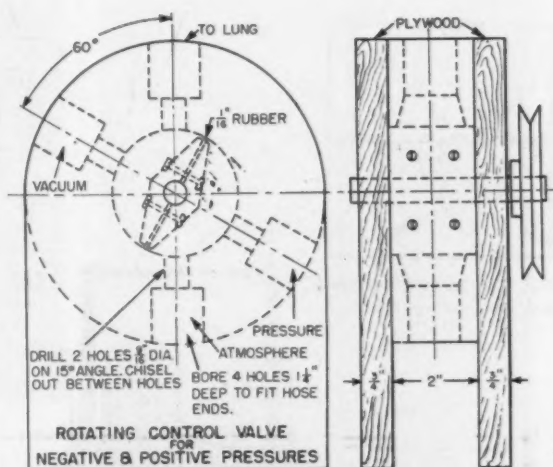


FIG. 5—Details of the rotary valve developed for use with the Muncie iron lung.

Ediphone Standardized

PLATING RACKS

IN plating over 500 different parts made of copper, brass, steel, zinc and aluminum, a few standardized multi-purpose plating racks are utilized at Ediphone Div., Thomas A. Edison Inc., to avoid multiplicity of racks. Since these racks are used for depositing nickel, copper, black nickel, cadmium, zinc, tin and chromium, they are not coated.

Racks of the type shown in figs. 1, 2 and 3 are used in the plating of 90 pct of the parts requiring plating other than chromium. They are all 2 ft long and are made of brass rod. Four standard racks of this type are used. The rack in fig. 2 is similar to that in fig. 1 except that it is smaller and used for smaller parts.

A variation of this type of plating rack is that shown in fig. 4, which is essentially a double rack. It is used in plating larger parts.

Other types of racks are shown in figs. 5, 6 and 7. These are designed for the specific parts shown and ordinarily are not used for any other parts. The rack in fig. 5 is shown carrying steel hearing tubes 6 in. long, racked to permit all surfaces visible after assembly to be black nicked without undesirable contact spots.

Fig. 6 shows a rack carrying brass mandrels with $\frac{1}{2}$ in. OD steel shaft having an overall length of 11 in. The mandrels are racked on pivot ends to permit plating without contact blemishes. The rack shown in fig. 7 is also a special purpose rack and is designed for cadmium plating the inside surfaces of a finished chromium plated tubular mandrel 7 in. long with $\frac{1}{2}$ in. ID. This operation is accomplished without disturbing the outside chromium finish. The vertical rod shown extending up through the tube serves the double purpose of inside anode and support for the mandrel tubes.

By P. B. KASAKOVE

Asst. Mgr. Mfg., Ediphone Div.
Thomas A. Edison, Inc.
West Orange, N. J.

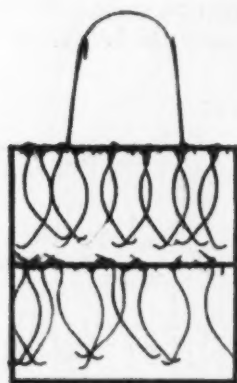


FIG. 5—Special designed rack for plating tubes.

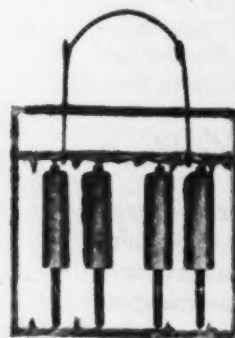


FIG. 6—Special rack for parts of brass and steel.

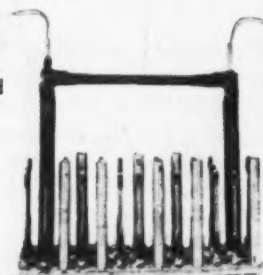


FIG. 7—Tubular parts are supported on mandrels.

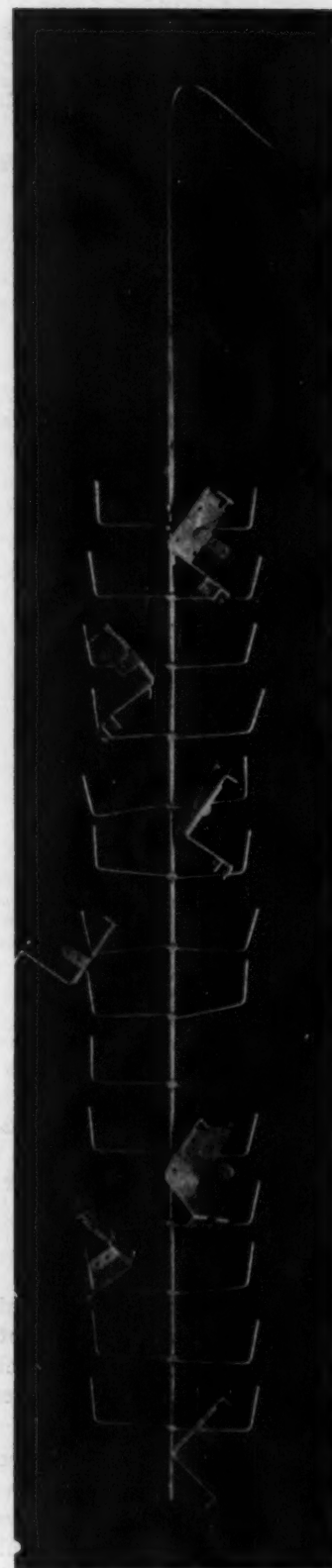


FIG. 1—One of the four standard types of plating racks used at Ediphone Div., T. A. Edison, Inc., for electroplating 90 pct of the parts requiring finishes other than chromium.

FIG. 2—Another of the four standard plating racks used for electroplating. This rack is slightly smaller and is used primarily for plating the smaller component parts.



FIG. 3—This rack is another of the four standard types of plating racks. All the standard racks measure 2 ft in length and are made of brass rod. They are not protective coated.

FIG. 4—A variation of the standard plating racks. The rack shown is essentially a double rack and is used chiefly in the electroplating of the larger components. These brass racks are assembled in the shop by brazing.



The Bendix plaster technique for Aluminum Castings

By H. A. KNIGHT
New York



Typical parts produced by the Bendix plaster process, including a torque converter unit, a 10-in. airplane landing wheel, and a 6-in. two-stage shrouded impeller.

SUMMARY: A technique is described for producing nonferrous castings to close tolerances and unusually high as-cast surface smoothness, developed by Eclipse-Pioneer Div., Bendix Aviation Corp. The process employs calcium sulphate, as a core and investment, mixed under vacuum and injected into an inverted mold under pressure.

A PROCESS for casting complicated parts of nonferrous metals by a plaster core technique with tolerances held to ± 0.005 in. has been developed at the Teterboro, N. J., foundries of Eclipse-Pioneer Div., Bendix Aviation Corp. The process involves such complete control of critical dimensions and surfaces that machining and balancing are almost totally eliminated. The process leaves clean cavities and bright surfaces. Such complicated parts as shrouded, high speed aircraft impellers are produced in one piece. Originally the part was made in four pieces. The process lends itself to mass production.

A typical product of the new technique is a shrouded two-stage, high speed impeller of Alcoa 355 aluminum, heat-treated and aged, a part rotates at a peripheral speed of 1500 ft per sec, or at 50,000 rpm.

The technique maintains critical uniformity and wall thickness, and gives a satin-smooth finish on either internal or external surfaces. Machining needed is virtually nil and consists principally in the easy removal of a few burrs. For example, on one two-stage impeller 1090 machine hours were saved through production by

this new method. Thin fins are conventionally the feature of such an airplane part and such fins can be produced efficiently by the plaster process. Smoothness of 30 microns, as cast, has been attained readily.

The process allows the production of larger parts, weighing 50 lb or more. The Teterboro foundries of Eclipse-Pioneer have already produced a number of airplane parts. Besides the 6 in., two-stage, high speed, shrouded impeller, they have also cast a turbine for a torque converter unit, structurally complex yet economically produced by the new method; and a 10-in. airplane landing wheel, so accurately cast that only the hub requires machining, and with weight savings of 2 lb over conventional methods of fabrication.

Other applications are: Diesel centrifugal compressors for use as scavengers; parts for jet engines; pumps which are to impel air or fluids; heat transfer equipment and chemical transfer equipment. In production now are impellers up to 18 in. diameter, while experimentally they are being cast up to 35 in.

It is expected that the process will be applied to casting of metals other than aluminum alloys.



A one piece shrouded high-speed impeller produced by the Bendix plaster process.

particularly the bronzes and, more particularly, manganese bronzes. Experiments are being conducted in casting magnesium, although all bugs have not been eliminated.

On a cost-per-pound basis, this plaster process cannot usually compare with sand, permanent mold and die casting, all of which the Teterboro plant uses. The process will be used where high quality castings are employed and where the payment of premium prices are justified. Yet in view of the factors involving an intricate pattern done in one piece, the smooth finish, close tolerances and minimization of machining, the Bendix technique is found economical in the long run.

The plaster itself is a commercially pure calcium sulphate, commonly called plaster of paris, made by the U. S. Gypsum Co. A water-base liquid is mixed with the dry calcium sulphate. This mix, after curing, has been successfully used in casting bronze with a melting point of 2400°F. Curing of the plaster is effected by a single baking operation.

While being encased by the melted aluminum alloy the plaster gradually loses strength, yet continues strong enough to maintain the tolerances and dimensions of the finished casting precise. After the aluminum has cooled sufficiently and assumed its final shape the plaster is further weakened by a soaking step so that it can be flushed out of the casting by a water stream at 300 psi pressure.

Some examples of parts produced by this process are illustrated, and include a guide wheel for use in a torque converter transmission, consisting of a web, shroud and 16 intricately-shaped

vanes. This wheel, ordinarily produced by assembly of its various elements, was cast in one piece, assuring proper spacing of vanes and uniformity of air passages and a satin finish. For



STEP 1—The plaster mix is agitated under vacuum.



STEP 2—After expendable vanes have been positioned in the permanent mold, the latter is inverted and a piston forces the plaster from a cylinder into the mold with an absence of bubbles.

the 10 in. airplane wheel the 2 lb saving in weight was accomplished by the casting of thin walls reinforced by internal ribbing. No machining of the rim for tire fit was required. In high speed impellers, uniformity of mass and shape, essential to withstand the effects of high speed, is accomplished.

Steps in producing a one-piece high speed shrouded impeller in Alcoa 355, illustrated in the accompanying photographs, are as follows: The first step is the forming of individual vanes designed to serve as cores, and the arrangement of these vanes in a permanent mold. The plaster and liquid is mixed thoroughly on an automatic agitator under a vacuum to remove all air bubbles from the plaster. The mold is inverted to facili-

tate attachment of the plaster injection cylinder. While still inverted, to eliminate the possibility of air bubbles being enveloped by the plaster, a piston forces the mixture from the cylinder and distributes it evenly to all parts of the mold.

For a parting agent a mixture of lard oil and carbon tetrachloride is used in the mold that forms the plaster cores; in the permanent mold for the final casting the agent is china clay.

After the plaster has been permitted to set and has been cured by a single baking operation, the cover is lifted off. A threaded pilot shaft helps loosen the plaster casting from the mold. The expendable vanes or cores are removed and flash marks and fillets are cleaned by hand, with sharp



STEP 3—After curing, the mold cover is lifted off. The threaded shaft helps loosen the plaster from the mold.



STEP 4—Metal vanes which serve as cores are removed; flash and fillets are touched up by hand.



STEP 6—The assembled mold is placed in a spinner and poured.

edges rounded off to complete the plaster core. After both the core and permanent mold have been preheated to a specified temperature, they are assembled and prepared for pouring. Speed and deft handling are needed to prevent significant loss of heat prior to pouring.

On a spinning turntable molten aluminum alloy is poured into a new mold where the alloy is distributed by centrifugal force. A restricted orifice meters the metal as it enters the mouth of the mold because the rate of flow is an ex-

tremely important factor. After cooling, the top half of the permanent mold is removed. The rough aluminum casting is separated from the mold and transferred to the clean-out booth where high pressure water jets remove all plaster in chunks.

Finally, the completed casting, with its intricate web of internal vanes, is critically examined for dimensional accuracy. Specifications for this part called for satin smooth surfaces on critical areas, as well as close tolerances.



STEP 5—The preheated core and mold are assembled and prepared for molding.



STEP 7—After pouring, the mold is disassembled. The casting, which contains the plaster core, is shown in the mold section on the crane hooks.

Home-ground Step Drills

Replace Subland Type

SUBSTANTIAL savings in tool cost are being made by Oldsmobile Div. of General Motors Corp. by substituting 2-flute step drills with special grinding done in their own toolroom for 4-flute subland drills. Both the 4-flute and the 2-flute drills perform the same operations equally well. However, the 2-flute step drill has several advantages. Four-flute subland drills are substantially weaker than 2-flute counterparts, and the notching done between the lands in grinding further weakens this type. As a result, breakage ran high. In addition, 2-flute drills cost less.

Fig. 1 shows the various types of drills. A is a typical standard 2-flute drill; B is a duplicate drill reground to provide a step drill for production work; C is a typical 4-flute subland drill of the type being displaced; and at D is an equivalent 2-flute drill now utilized for the same work.

Ten 1/2-in. step drills are used to drill and chamfer holes for subsequent tapping in the axle housing, using a Greenlee horizontal drilling ma-

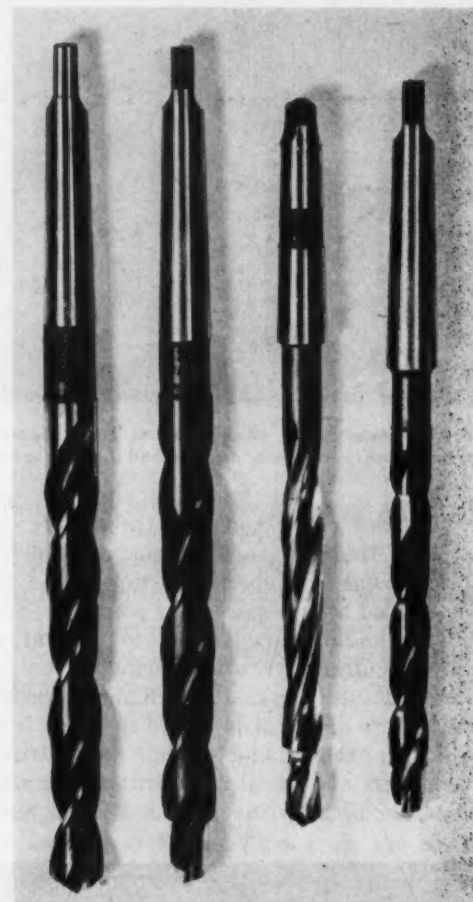


FIG. 1—A comparison of drills showing standard 2-flute, stepped 2-flute and 4-flute subland types.

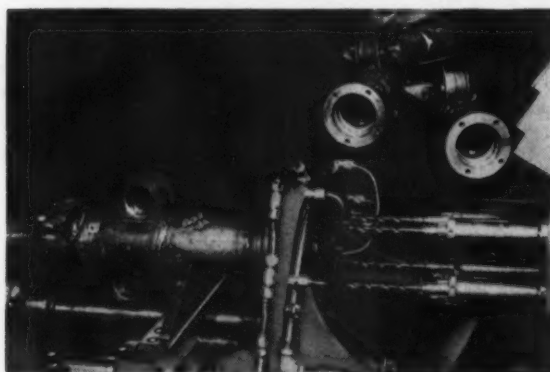


FIG. 2—Multiple drilling setup using 4 step drills for producing countersunk holes in axle flanges.

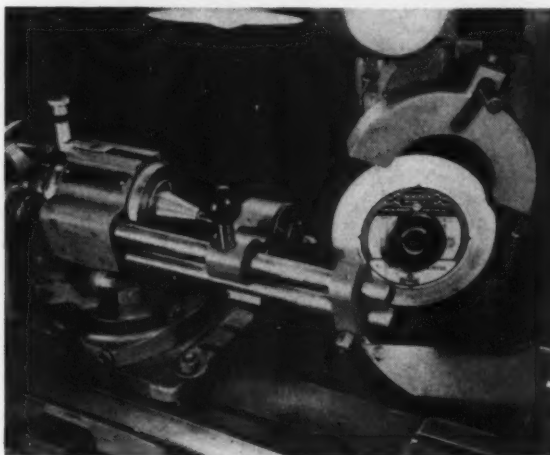
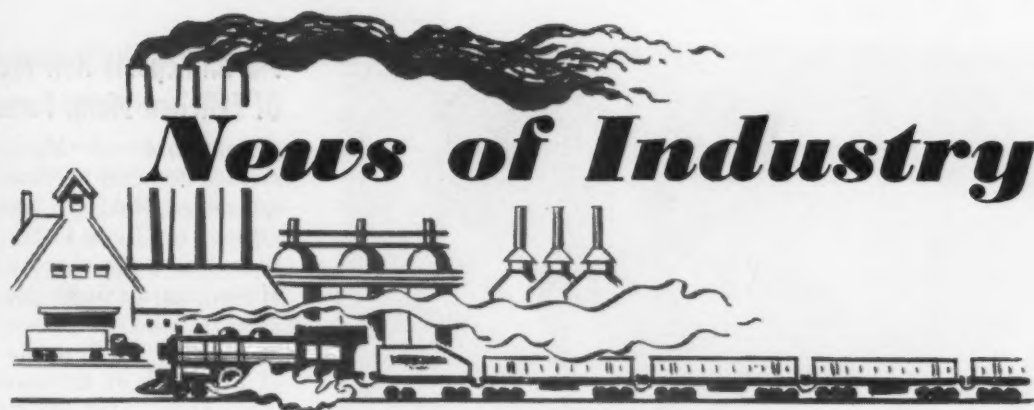


FIG. 3—Setup for grinding step drills. Drill is held in a special collet in a tap grinding fixture.

chine for which subland drills had cost \$5.63 each. Equivalent 2-flute step drills cost only \$1.38 each, after allowing for grinding the step and smaller diameter. Similarly, fig. 2 shows another drilling setup, on a W. F. and John Barnes Co. multiple drilling machine, where four chamfered holes are drilled for tapping. Subland drills cost \$4.35 each, as against a net cost of \$1.75 each for 2-flute drills on which a step has been ground.

The standard 2-flute drills are ground in a tap grinding fixture using a special collet to hold the drill and setup on a No. 13 Brown & Sharpe grinder as shown in fig. 3. Both the reduced diameter and the step can be quickly and precisely ground in this setup. A narrow beveled wheel is employed. Relief is provided by using a 0.050-in. drop cam to rock the fixture when grinding the relief.



Who'll Pay for Pensions and Insurance?

Fairless and Murray exchange sharply worded wires as companies balk at paying full cost of pension and insurance programs—By GEORGE F. SULLIVAN

New York — Philip Murray threw a wrench into the machinery that might have started grinding out a settlement to the steel dispute last week when he demanded acceptance of the recommendations of the Steel Industry Board as a basis on which to conclude a settlement. Benjamin F. Fairless, for U. S. Steel, had agreed to resume negotiations, and twice again during the week he offered to do so. It looked as though Steelworkers president Murray was leaving himself open to an unfair labor practice charge of refusing to bargain collectively.

Who Will Run Steel Industry?

The first impression steel men got of the board report was a pleasant surprise. It was milder than they expected. They were optimistic. A few days later—after the union had taken a firm stand for the board report—steel men began to worry. It was as though they had discovered the recommendations had been booby trapped with a bomb set to go off with a small bang next year followed by bigger bangs each succeeding year until the whole mess blew up in their faces.

Back of the steel companies' re-

fusal to accept the principle of non-contributory pensions was another more important question: "Who is going to run the steel industry — labor, government or management?"

It happened like this: The board's report was accepted by the union "as a basis on which to conclude a settlement" in a telegram to the President on Monday, Sept. 12.

Mr. Fairless read this in the paper next day and wired Mr. Murray that U. S. Steel was ready to resume collective bargaining. Next morning, Sept. 14, Mr. Fairless was startled to get a Lewis-

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Employees Favor Steel Strike

Detroit—Employees of Detroit steel mills have voted overwhelmingly in favor of a strike.

Vote at Rotary Electric Steel Co. was 353-47 in favor of a strike.

The vote by employees of Republic Steel & Tube, Ferndale, was 112-47.

With another day of balloting to come, 8502 out of 10,000 eligible employees at Great Lakes Steel plants had cast a ballot.

Crack Down on Truckers

Erie, Pa.—State police weighing details are active again checking trucks for possible violation of Pennsylvania's weight laws. They reported that in a 48-hour period, 150 trucks were found to be overloaded, about half of them with iron and steel products.

The truckers, trapped when police established road blocks on three important east-west highways, were fined from \$25 to \$50 and, with the exception of those hauling perishables, ordered to "trim" their loads before continuing. Police said the road blocks will be continued indefinitely. One truck was found to be carrying 104,000 lb of steel. Legal limit for most trucks in Pennsylvania is 45,000 lb.

New Casting Process Molds, Forges, Coins Simultaneously

Canaan, Conn.—A metal casting process which simultaneously casts, molds, forges and coins a product to finished state, eliminating 60 to 70 pct of normal machining operations, was reported last week by Budds Aero Castings, Inc.

Harold Budds, president, said the process, called "Bacco," has already been successfully applied in the manufacture of products for Army and Navy ordnance, Grumann Aircraft Corp., F. L. Jacobs Co., Bristol Co., and Fairchild Engine & Aircraft Corp.

He said the process can hold tolerances from 0.001 to 0.002 in.



PROMOTED: These executives of Granite City Steel Co., Granite City, Ill., were advanced to vice-presidents. Left to right, are: N. P. Veeder, vice-president in charge of operations; J. L. Hamilton, Jr., vice-president in charge of sales; and J. D. Streett, vice-president in charge of development.

ECA Issues Guarantee For Capital Venture in Italy

Washington—The Economic Cooperation Administration recently issued its seventh guarantee of private capital in western Europe. It was in the amount of \$60,300 representing new capital of the Westinghouse Air Brake Co. to increase plant facilities in Italy.

The expansion involves the plant of the Compagnia Italiana Westinghouse Freni e Segnali, a subsidiary, at Turin. It makes railway and automotive air brakes, signal devices and other company products.

Total of the seven industrial investment guarantees—five in England and two in Italy—amounts to about \$2.8 million. Applications are pending for an additional \$12 million.

Staley Starts New Plant

Decatur, Ill.—A. E. Staley Mfg. Co. has started construction of a new soybean oil extraction plant which will be completed by next July. The construction contract was awarded to H. K. Ferguson of Cleveland and is another part of the company's program for modernization of its processing facilities.

The new plant will have a rated daily capacity of 800 tons of soybeans and will be adjacent to the first plant, completed 4 years ago, which has a rated capacity of 500

tons. Staley Mfg. spent \$2½ million on its first extraction plant and this new unit it is estimated will exceed the cost of the first one.

Pig Lead Exports Drop 80 Pct

Washington—Expiration of the temporary suspension of duties on lead as of June 30 was followed by a drop of \$2.1 million in pig lead exports from the June figure of \$11.5 million.

Nonferrous and concentrate imports also suffered a recession, declining from \$20 million to \$9 million.

Building Permits Increase

Boston—Applications for building permits in Massachusetts rose 22.8 pct last month over August 1948. Construction plans include 1049 new residential buildings with 1787 dwelling units, many of them part of the veterans housing program. The figures are based on applications of all cities and 29 largest towns.

Refrigerator Demand Rises

Erie, Pa.—A pickup in refrigerator business is making it possible for the General Electric Co. to begin recalling a substantial number of the 4000 workers laid off at the plant here last spring. Continued demand will determine whether all the workers are rehired.

Martin Reports New Method Of Efficient Metal Forming

Baltimore—A highly efficient method of metal forming by a process called Marform has been developed by Glenn L. Martin Co. It is said to yield sheet metal parts at savings up to 50 pct. Tool engineers who developed the new method say it can produce savings of hundreds of thousands of dollars annually for the aircraft and other industries.

They report that the new process results in a substantial increase in the rate of production of detailed parts, and a decrease in labor and tooling costs. Parts produced by this method are held to close dimensional tolerances, usually obtained only by expensive tooling.

The company said it is possible to form stainless steel exhaust stacks, for example, with important reductions in tooling cost and at a rate 10 times faster than with conventional methods. The estimated rate of output is 50 per hr. compared with the drop hammer rate of 3 or 4 per hr. A variation greater than 5 pct in material thickness is called unusual in these severely formed parts.

The principal feature in the process is the precision control of the pressure curve for the forming cycle of the part. This enables a part to be formed free of wrinkles and reduces springback to a minimum.

In addition to simple draw operations, the process can be utilized to form and trim flanged parts such as airplane nose ribs.

Allocations Officially End

Washington—The voluntary allocations program, administered by the Commerce Dept.'s Office of Industry Cooperation, will become a thing of the past one week from tomorrow.

At one time, the voluntary program was used to channel steel products to 18 different industries and government departments. A single plan for the allocation of pig iron was also in effect.

Geiger Counter Finds A New Use in Analyzing Steel

Measures fluorescent rays that emanate from sample under X ray

New York—The Geiger counter, which has become quite useful in metallurgical research, has found a new application in the steel industry in the analysis of steel samples.

According to scientists of the Research Laboratory, U. S. Steel Corp. of Delaware, Geiger counter analysis may be even faster than the direct-reading spectrograph, in revealing the kind and quantity of alloying elements in steel.

Since it is capable of detecting and measuring radioactivity, the Geiger counter is capable also of measuring invisible fluorescent rays that emanate from a steel sample when its atoms are ionized by powerful X-rays.

A 20-ma, 50-kv, molybdenum target X-ray tube is used in the U. S. Steel laboratory studies. The ray floods the steel specimen, exciting secondary rays which are characteristic of the chemical elements alloyed with iron in the sample.

Automatically Plots Intensities

The instrument used in the Kearny laboratory has a counting circuit, like other laboratory counters, but for this purpose the counter has been connected to a standard recording instrument which automatically plots the intensities of the various elements on graph paper.

This nondestructive method of analysis is best adapted to detect and measure elements of "middle" atomic weight. Among these are chromium, manganese, molybdenum, nickel, copper, columbium, titanium, tungsten and vanadium.

Amertool Files Export Papers

Washington—Amertool Services, Inc., Cincinnati, recently filed papers with the Federal Trade Commission under the Export Trade Act (Webb-Pomerene law) for the exportation of machine tools and related equipment.



LEWIS SPEAKS: Silent John Lewis, UMW president, told newsmen last week that "no progress was made" in talks with Northern and Western coal operators. Negotiations are slated to continue this week. Reporters, hopeful of a scoop, look a bit disgruntled as they query their enigma (See story on p. 131).

Submits Plans for Union Freight Terminal for St. Louis

St. Louis—Inland Waterways Corp. which operates Federal barge lines, has submitted plans for a modern union freight terminal to serve barge, rail and highway traffic for the port of St. Louis. St. Louis is the head of navigation and interchange points for joint barge-rail traffic to the upper Mississippi and Missouri Valley. Tow boats sail from the city in four directions, to New Orleans, Chicago, the Twin Cities and Omaha. For many years the St. Louis terminal has been inadequate for the proper and efficient handling of river traffic. Recently the principal terminal at North Market St. has deteriorated so rapidly that it soon will be useless as a river facility.

Inland Waterways Corp. appraisal and recommendation for new facilities consists of a new dock 1200 ft long to cost approximately \$200 million to provide adequate facilities to accommodate ocean traffic to and from St. Louis and suggests the enlargement of these plans to provide for a 2000 ft dock at a cost of approximately \$3 million.

The new facilities recommended are based on the fact that the St. Louis area requires a river terminal with a daily capacity of at least 2400 tons and a prospective capacity at a later date of

4000 tons. The 1200 ft long dock would provide efficient railroad track arrangements, modern warehouse and truck terminal buildings with approximately 130 sq ft of floor space with provisions for a roof over 500 ft of the barge and car working area, plus installation of modern cranes and handling facilities.

Long range plans for a modern river terminal at St. Louis, the corporation declared, must contemplate a minimum annual capacity of 600,000 tons with good possibilities of increasing this capacity to as much as one million tons yearly. The report further recommends that work on the project should be started as soon as possible.

Release ECA Funds to Bizone

Washington—Bizone Germany has been authorized by ECA to use the equivalent of \$13 million in counterpart funds for completion of a new power station in western Berlin. It will have 110,000 kw capacity.

In addition, the Reconstruction Loan Corp. in Germany will make another \$3.7 million available to the development firm, the Berliner Elektrizitat Werkstette Aktien Gesellschaft.

Previously, the ECA had released \$19 million in counterpart funds for railroad reconstruction, power facilities, and port rebuilding in the French zone.

INDUSTRIAL SHORTS

SO BIG—The biggest stationary openhearth furnace in the history of the steel industry has been placed in operation at the plant of the WEIRTON STEEL CO., Weirton, W. Va. The furnace has been rebuilt and enlarged to a capacity of 550 tons.

WIN A PRIZE—The Tocco Div. of the OHIO CRANKSHAFT CO., Cleveland, is tying into the Metal Show theme of Economy in Production by sponsoring a contest with prizes of \$1000, \$500 and \$250 for the best article on "Economy in Production With Tocco Induction Heating." All entries must be accompanied by official entry blanks which can be obtained by writing to the company.

GIVING GENEROUSLY—REYNOLDS METALS CO., Richmond, Va., and the PROCTER & GAMBLE CO., Cincinnati, have become industrial sponsors of the University of Chicago's \$12 million basic atomic and metals research program.

AT YOUR SERVICE—Two engineering service offices have been added by McNALLY PITTSBURG MFG. CORP., Pittsburg, Kan. One in Terre Haute, Ind., in charge of Jerome V. Lentz and the other in Charleston, W. Va., with Irving M. Craig in charge.

OUTGROWS PLANT—Announcement has been made that CECO STEEL PRODUCTS CORP. is planning to build a new fabricating plant in Birmingham. The company has purchased 12 acres of land for its new operation and hopes to have construction completed by next spring.

OPENING IN DENVER—A new building in Denver providing office and warehouse facilities will be opened Sept. 30 by JOHN A. ROEBLING'S SONS CO., Trenton, N. J., manufacturers of wire products.

HOT ORDER—Bethlehem Steel Co. has placed an order with SURFACE COMBUSTION CORP., Toledo, for annealing furnaces for their expansion program at Lackawanna. The order amounts to \$2 million worth of the latest type cover furnaces.

NALCO METAL—A new lead alloy for use in the chromium plating industry has been announced by the NATIONAL LEAD CO., New York. Called Nalco Metal, the new alloy is designed to give considerably longer service in industrial and decorative plating.

NEW MARKET—Gast Mfg. Corp., Benton Harbor, Mich., manufacturers of rotary air motors, compressors and vacuum pumps has appointed PROCESS INDUSTRIES ENGINEERS, INC., Pittsburgh, as their sales engineering representative in western Pennsylvania, eastern Ohio and all of West Virginia.

ITS OWN YARN—Howard Asbestos Co., Northfield, Vt., has been purchased by the RUSSELL MFG. CO., Middletown, Conn., insuring a supply of asbestos yarns for the company's automotive friction materials. The new wholly owned subsidiary will be known as the Russell Asbestos Corp.

HERBRAND GROWS—Assets of Superior Mfg., Cleveland, toolmakers, have been acquired by the BINGHAM-HERBRAND CORP. of Toledo and Fremont, Ohio, and will operate as a part of the Herbrand Div. J. E. Terry, associated with Superior since its founding in 1932, will carry on as general manager.

BRANCHING OUT—A new warehouse has been opened at 447 West Congress St., Detroit, by the MORSE TWIST DRILL & MACHINE CO. of New Bedford, Mass.

Munitions Board Considering Aluminum Purchasing Program

Washington — The Munitions Board now has under consideration the question of setting up a purchase program for the stockpiling of aluminum. The metal is on the board's group two list (essential but not urgent).

The program was endorsed last week by the board's aluminum and magnesium industry advisory committee, which feels that the time is now ripe for such action.

At the same time, the committee recommended that the board establish slightly higher purchase specifications than those normally used by industry. It suggested for percentage of silicon by weight, 0.15 max; iron, 0.25; and total elements other than silicon, iron and aluminum, 0.10 max.

The committee believes production is such that the industry could set aside for the stockpile some 150 million lb of metal without an adverse effect on domestic requirements.

This figure includes the 60 million lb which the government has already agreed to accept in lieu of cash as rental or purchase payments for government-built war plants. Permanente Metals Corp. will deliver 36 million lb and Reynolds Metal Co. will ship 24 million lb on this basis.

Laurence C. Dean Dies Suddenly

Buffalo—Laurence C. Dean, well known Buffalo newspaperman, died suddenly at his home here last Wednesday. He was 48.

As financial-industrial editor of the Buffalo *Courier-Express*, Mr. Dean had a wide circle of friends in industrial and business circles, not only in Buffalo but also in the entire East. During the past several years he had served as correspondent for THE IRON AGE in the Buffalo area.

His death came as a distinct shock to his fellow-workers who had seen him at his desk the previous day. He had shown no signs of being ill. Last May he had been ill for 2 weeks as a result of a heart attack.

Inland's Insurance Tops Recommendation

Workers at Inland reject fact finders recommendations because they are "doing better now" . . . Plan is contributory but benefits are bigger—By D. I. BROWN

Chicago—Exception to the CIO economists' claim of "historical" victory concerning the steel board's report was taken last week by CIO Local 1010 at Inland Steel Co. The negotiation committee of this local on Tuesday, Sept. 13, unanimously rejected the steel fact finders 10¢ an hr pension-insurance recommendation when president Harry Powell said, "We are doing better than that now under the pension-insurance plan that Inland has."

This local represents 16,500 workers at the Indiana Harbor plant and Mr. Powell said he had telegraphed the protest against the board's recommendation to Phil Murray. Later he toned down his objections. Evidently CIO chieftans persuaded him he had acted too hastily.

Inland has announced they are willing to "sit down with the union and review the insurance and pension plan." In doing so they are merely continuing negotiations that were broken off just prior to the creation of the steel board by the president.

Inland Made an Offer

Local 1010 was not in favor of breaking off those negotiations, but were forced by political pressure from CIO headquarters to do so. Clarence Randall, president of

Inland, declared before the steel board in New York City that "We made an offer on pensions. We were confident that our employees liked that offer but the global strategy of the union required that it be rejected and that no single company be permitted to make an agreement."

Inland's plan is a contributory one in which the company pays 57 pct and employees 43 pct of the total cost. Inland's plan went into effect in 1943 and this year the company offered to write it into the contract. Inland is now paying a little over 10¢ per man hr into the combined pension and insurance plan.

Inland Payments Are Bigger

Because pensions must be studied and separate agreements signed, which will not be done until next year, the only comparison possible at this time is on insurance. The fact finders recommendation of 4¢ an hr for insurance will buy many types of coverage depending on what is wanted. The present Inland insurance plan is shown in the table.

The union's insurance demands are shown at the bottom of the table in cases where direct comparison is possible. At present the board's recommendation of \$200 maximum surgical benefits tops

Inland's allowance but Inland did offer to boost theirs to \$200 during the negotiations.

Class 3 represents the average earnings of Inland employees last year. Annually this amounts to \$3875 in wages so that Inland's amount of basic insurance is much higher than the board's recommendation of "one year's pay." Also the Inland plan offers higher paid up insurance at retirement or in case of permanent disability.

The board's recommendation for paid up insurance is \$1250. Inland's paid up insurance figured on Class 3 average worker earnings is \$1600. The \$500 funeral expense is provided by Inland alone at no cost to the employees insured under the plan.

The weekly accident and sickness benefits are also higher in this company's plan than the

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Markets Alloy for Nodular Iron

New York—A magnesium-ferrosilicon alloy that promotes the formation of nodular graphite in cast iron is now being marketed by Electro Metallurgical Div. of Union Carbide & Carbon Corp.

The alloy contains about 7 to 10 pct magnesium, approximately 43 pct silicon, and the balance chiefly iron. It is available at a development price of 15¢ per lb.

Haglund, Steel Official, Retires

Sterling, Ill.—A. L. Haglund has retired from the position of executive vice-president of Northwestern Steel & Wire Co. because of ill health. He had served with the company for a total of 40 years.

Inland's Insurance Plan

Class	Monthly Earnings	Group Life Insurance	Funeral Benefit	Accidental Death and Dismemberment	Weekly Accident and Sickness	Daily Hospital Expense	Daily Hospital Expense for Dependents	Additional Charges for Employee and Dependents	Surgical Payment—Employee and Dependents	Employee Only	Employees Monthly Contribution	
											With One Dependent	More Than One Dependent
1	\$200 and less than \$249	\$4,000	\$500	\$4,000	\$28.00	\$5.00	\$5.00	\$50.00	\$150.00	\$5.30	\$6.20	\$6.60
2	\$250 and less than \$299	5,000	500	5,000	35.00	5.00	5.00	50.00	150.00	6.40	7.30	7.70
3	\$300 and less than \$399	8,000	500	5,000	35.00	5.00	5.00	50.00	150.00	8.50	9.40	9.80
4	\$400 and less than \$499	10,000	500	5,000	35.00	5.00	5.00	50.00	150.00	9.90	10.80	11.20
5	\$500 and less than \$599	12,500	500	5,000	35.00	5.00	5.00	50.00	150.00	11.65	12.55	12.95
Union's demands—		One										
Estimated cost 6.27¢		Years										
per hr per man		Pay	?	?	31.50	?	?	?	200.00	Non-Contributory		

Machine Tools Evaluated On The Same Basis as Securities

Cleveland—Extending its theme: "Machine Tools — The World's Best Investment," the machine tool industry through the National Machine Tool Builders Assn. is stimulating interest in evaluating machine tools on the same basis on which securities are evaluated. Scrutiny of its ability to improve earnings, current value, ratio of market value of new to old equipment, obsolescence and other factors should be applied to machine tools, since the major investment of any manufacturer is production machines. They must have the capability of

maintaining the manufacturer's industrial and competitive position and improve his prospects.

This chart provides a basis of comparing investments in securities with those in machine tools. The concept of having machine tools appraised regularly by second hand machinery dealers will give the manufacturer a fair evaluation just as a periodical review of securities, and replacements can be made where such action would give a better yield. Obsolescence, a hidden industrial disease difficult to detect in its early stages, the association points out, advances constantly and often rapidly. While a plant may be in excellent operable condition, be-

cause competitive plants have found better methods, it may be unable to compete profitably.

By judging machine tools on the same basis as a security investment, using the specific analytical checkpoints shown, the manufacturer can quickly isolate equipment that is a liability.

Inland's Insurance

Continued from Page 101

board's recommendation. However, the union wants 26 weeks' duration on this benefit, Inland's is good only for 13 weeks.

Board Plan Cuts Benefits

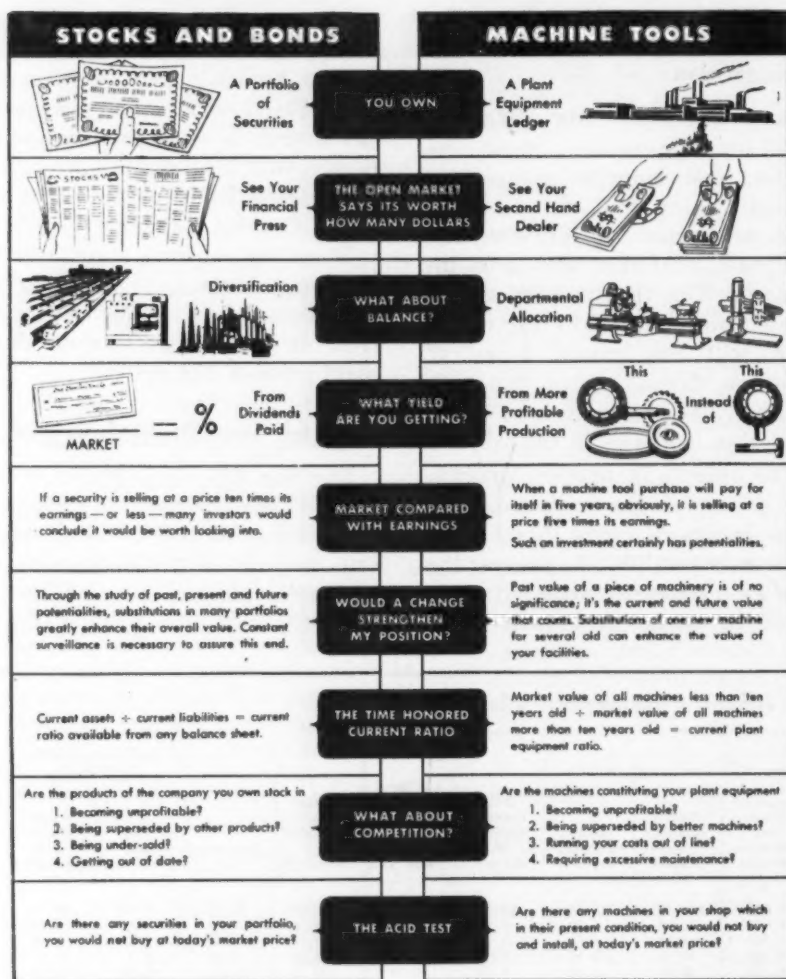
It is impossible to compare other benefits as the board left most of these open for negotiation. The board made available \$80.00 a year for each employee under the 4¢ per man-hr board recommendation. This amount will buy little more than the straight hospitalization and surgical benefit coverage of the type offered by Blue Cross and Blue Shield. Of course, Blue Cross allows more for surgical and hospital benefits.

An Inland employee with one dependent in the Class 3 earnings bracket now pays out of his own pocket 5.4¢ an hr. The board's decision if applied to Inland would mean that the company's present plan, to which 99.5 pct of all employees belong, would be dropped as a mere 4¢ from the company can't possibly buy the coverage shown in the table unless employees contribute. Mr. Powell told THE IRON AGE that 4¢ would cover the present insurance benefits if handled as a trust fund instead of by insurance companies.

Could Be Contributory

Other workers elsewhere may like the board's recommendations because something is always better than nothing. However, in the case of Inland the employees may prefer the bigger, better package regardless of the fact that they contribute to part of the total cost. The board foresaw such situations

IF A MACHINE TOOL IS AN INVESTMENT WHY NOT APPLY SOME OF THE SAME YARDSTICKS?



Why not get current market quotations on all the machine tools in your plant and review them, just as you review the securities in your investment portfolio; making replacements where such action would result in a better yield?

and in part H section 5 of their report they state, "As a result of bargaining it is possible that the parties may agree that the employer should pay 4¢ to buy some of the items . . . and that the workers should pay 2¢ or some other amount to buy other items."

Thus the only ceiling set by the board is industry's contribution. Employees may be free to add whatever they wish in order to obtain what they feel is adequate coverage. Some believe that local 1010's rejection was an aggressive step in trying to head off a single national plan being set up by CIO chieftans which might preclude individual agreements on plans above the minimum level recommended by the board. Mr. Powell denied that this was true.

Make \$6,400,000 Shopping Tour

Pittsburgh—On a \$6,400,000 shopping tour, two representatives of Usinor, a French steel combine, were here last week inquiring into the possibility of buying 80,000 tons of steel coils for processing on their cold mill at Montataire, France.

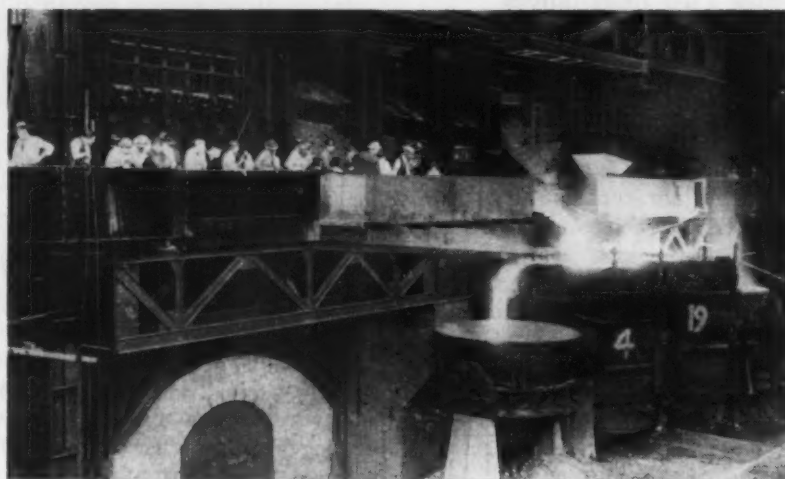
George Crancee, managing director of Usinor, and Joseph Castaing, chief engineer, visited the Irvin Works of U. S. Steel Corp. and the Aliquippa Works of Jones & Laughlin Steel Corp.

Mr. Crancee said the purchase would be made through the Economic Cooperation Administration.

Expresses Need for Research

Chicago—Dr. Haldon A. Leedy, director of Armour Research Foundation of Illinois Institute of Technology, in a speech before the Optimists Club here, declared that the future of industry depends on scientific research. Dr. Leedy described ten possible objectives of well organized research programs.

He told the group that very few industries could afford the costly staff and equipment necessary to solve complex research problems and many firms have turned to outside research organizations.



Largest Stationary Openhearth Placed in Operation

Pittsburgh—The biggest stationary openhearth furnace in the history of the steel industry has been placed in operation at the plant of Weirton Steel Co., Weirton, W. Va.

The furnace is Weirton's No. 1, which has been rebuilt and enlarged from a former capacity of 200 tons to a new capacity of 550 tons. The capacity of the new furnace is more than three times as large as the average capacity of openhearth furnaces currently used in the steel industry.

The openhearth furnace is a rectangular structure built chiefly of steel, concrete, refractory brick and other refractory materials. The overall dimension of the new furnace are: Length, 96 ft 6 in.; width, 29 ft 3 in. at the center and 24 ft 6 in. at the ends; height, 15 ft from the hearth floor to the top of the furnace. The furnace contains more than 1000 tons of steel and refractory materials in varying sizes equivalent to 1 million 9-in. bricks.

The openhearth furnace is used in the manufacture of low carbon steel, which constitutes the great bulk of the total tonnage of steel produced each year and, therefore, is the kind of steel used in automobile bodies and chassis, refrigerators, stoves, electric appliances, light fixtures, tin cans and many other familiar products. Carbon steel must be made in many types and grades to meet both the manufacturing and end use requirements of different products, and the openhearth process permits the manufacture of this steel to exact specifications.

In preparing an openhearth heat, steel scrap and molten iron are charged into the furnace together with limestone. After a "melt" of from 12 to 20 hr, molten steel is tapped from the furnace to be poured into ingots and started on the journey through the rolling mills.

Hotpoint Sales Ahead '48

Chicago—Sales of Hotpoint, Inc., for the first 8 months of this year are running ahead of last year, according to James J. Nance, president. He said the company launched a vigorous sales program in July which increased volumes enough to overcome sales decreases during the second quarter.

Schedules AISE Convention

Pittsburgh—Approximately 40 technical papers will be presented at the 1949 annual convention of the Assn. of Iron & Steel Engineers here Oct. 3, 4, 5 and 6. More than 3000 engineers and steel mill operators and representatives of allied industries are expected to attend.

Pension Plan Negotiations Would Face Knotty Problems

Aside from basic principle of who pays there are many skeins to unravel.

Pittsburgh—Apart from the steel companies fundamental objection to non-contributory pension plans, as recommended by the fact-finding board, many other knotty problems would confront company-union negotiators in seeking agreement on a pension plan for hourly-paid employees.

On the issue of whether employees should or should not share in the cost of a retirement program, there is evidence in plans already established to support both points of view. In a study of 289 pension plans, issued last year, the Bankers Trust Co., New York, reported that the ratio of contributory to non-contributory plans is about 50-50. Steel companies were included in this study.

Until recently, however, pension plans in the steel industry were not subject to union-company bargaining. Producers fear that if the non-contributory principle were established successive union demands for higher company contributions would be more likely to follow than if employees were called upon to increase their contribution in proportion.

It was pointed out the board used the words, "at the outset" in its recommendation of a 6¢ per hr per employee pension contribution by steel producers.

Some Important Questions Loom

Here are some important questions likely to arise if and when the steel companies and the CIO United Steelworkers of America sit down to discuss pensions:

1. How much would 6¢ an hr buy in the way of retirement benefits? The board estimated, "On the basis of the union's estimate," that it would bring about \$70 a month which when added to social security benefits, would provide \$100 a month plus on retirement. Producers say the board's estimate should have been closer to \$35 than \$70.

2. Assuming that agreement on

a plan is reached, will the Bureau of Internal Revenue approve from an income tax standpoint?

3. Some producers are wondering whether stockholder approval should not be obtained before putting a company-financed retirement program into effect.

Board Recognized Differences

The board itself recognized the "wide differences of opinion" that prevail as to particular features of a pension plan. These include: Whether pensions should be uniform or flat amounts irrespective of length of employee service; how to meet accrued liability for past service; whether retirement at 65 should be compulsory; whether the union should share in supervision of the plan; whether it should be handled by a trust fund or by insurance carrier; whether a worker should have vested rights in case of withdrawal from service.

While general features of a plan might be applied to many or all companies, it was pointed out that in many respects, a pension program would of necessity be largely tailor-made to fit conditions found in each company.



"We'd better check on that department, eh?"

Report Describes Production Of Steels from Sponge Iron

Washington—The results of tests in which steel was produced from sponge iron at the Bureau of Mines pilot plant at Redding, Calif., are given in a report released recently.

It describes the melting facilities used at Redding, and describes and gives the analyses of the several types of sponge iron that were used. It also discusses reducing agents, fluxes, and alloys, as well as describing the types of alloys produced and the furnace practice used.

An analysis of steels produced also is given. The report notes that the work of determining the physical and mechanical properties of the sponge-iron steels is in progress, and the results will be reported when available.

Pass Reciprocal Tariff Law

Washington — Legislation authorizing the State Dept. to enter into reciprocal tariff-cutting agreements with foreign nations until June 30, 1951, became law this week.

The new law, signed by President Truman after hot debate in both Senate and House, extends the Administration's reciprocal trade agreements program that has been in existence since 1936.

President Truman's signature on the bill opens the way for the state department to act on multilateral trade agreements involving about 130 commodities recently entered into at Annency, France.

Shares TVA Contract

Pittsburgh—Westinghouse Electric Corp. is building two water-wheel generators which will add 72,000 more kw of power to the Tennessee Valley Authority's electrical network, raising total output to 216,000 kw.

Valued at \$1,857,496 the equipment will be completed in 1951 for installation at the Pickwick Landing Dam on the Tennessee River, bringing the number of water-wheel generators at the site to six.

H. A. Roemer, Jr., Gets New Post

Sharon, Pa.—Appointment of Henry A. Roemer, Jr. as vice-president and general manager of Sharon Steel Corp., was announced last week by Henry A. Roemer, president, following action by the board of directors.



H. A. Roemer, Jr.

The Younger Mr. Roemer had been vice-president in charge of raw materials, purchasing and traffic. He joined Sharon Steel in November 1931 but left a year later to work for Republic Steel Corp. He was with Pittsburgh Steel Corp. from July of 1936 to May 1945 when he rejoined Sharon at its Detroit plant. He returned to Sharon in 1947 as vice-president.

Five changes in the sales department were also announced: R. C. Garlick, who was assistant vice-president, has been appointed assistant vice-president and general manager of sales. N. R. Mehler, who has managed Sharon's New York district sales office the past 4 years, has been appointed assistant general manager of sales and will be located at Sharon. W. J. McCune, who has been manager of stainless and alloy sales, is promoted to assistant general manager of sales. T. M. Galbreath succeeds Mr. Mehler as New York district sales manager.

Battle of the Telegrams

Chicago—Inland Steel Co. wired the United Steel Workers last Thursday urging immediate resumption of the collective bargaining conferences which the union broke off with the company on July 13. The whole telegram in effect said let's get down to business.

On Friday the union wired back their standard reply indicating the company must agree to accept the fact finding board's decision before the union is willing to sit down and bargain. Clarence Randall, presi-

dent of Inland, immediately wired Philip Murray suggesting they stop exchanging telegrams and allow the principals to get together immediately. Mr. Randall also charged "your attitude is a refusal to bargain."

Mr. Murray had previously stated the union was ready not only to negotiate separately, but also to reach separate agreement with any steel company—big or little.

Exports, Imports Show Drop

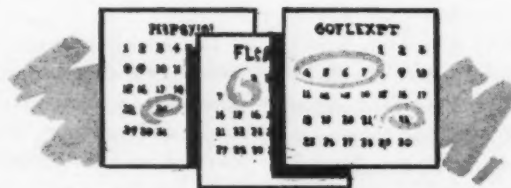
Washington—Across the board United States exports for July declined to \$887 million from the June figure of \$1,093 million. Imports likewise declined from \$531 million to \$458 million.

Defense Dept. Lists Small Business Liaison Officials

Washington—Continuing its campaign to assist business, the Defense Dept. has released a list of 170 "small business liaison officials" who have been named to assist in contacting the proper procurement authorities in the Army, Navy and Air Force.

These newly designated officials are in addition to those who have been assigned to the department's Central Military Procurement Information Office recently set up in Room 3-D-760 of the massive Pentagon.

The names on the new list are largely liaison men.



Dates to Remember

- | | |
|-------------|--|
| Sept. 25-28 | American Mining Congress, metal mining convention, Spokane. |
| Sept. 25- | American Institute of Mining & Metallurgical Engineers, |
| Oct. 1 | midyear meeting, Columbus, Ohio. |
| Sept. 26-28 | National Electronics Conference, Chicago. |
| Sept. 27-30 | American Society of Mechanical Engineers, fall meeting, Erie, Pa. |
| Oct. 3-4 | Steel Founders Society of America, fall meeting, White Sulphur Springs, W. Va. |
| Oct. 3-5 | American Coke & Coal Chemicals Institute, annual meeting, Skytop, Pa. |
| Oct. 3-6 | Assn. of Iron & Steel Engineers, annual convention, Pittsburgh |
| Oct. 4-6 | Industrial Packaging & Materials Handling Exposition, annual convention, Detroit. |
| Oct. 10-14 | American Society for Testing Materials, West Coast meeting, San Francisco. |
| Oct. 11-14 | American Standards Assn., annual meeting, New York. |
| Oct. 12-15 | Electrochemical Society, semiannual meeting, Chicago. |
| Oct. 13-15 | Foundry Equipment Manufacturers Assn., annual meeting, White Sulphur Springs, W. Va. |
| Oct. 17-20 | American Gas Assn., annual convention, Chicago. |
| Oct. 17-21 | National Metal Congress, Cleveland. |
| Oct. 24-26 | American Gear Manufacturers Assn., annual meeting, Chicago. |
| Oct. 26-28 | National Metal Trades Assn., annual convention, Chicago. |
| Oct. 27-28 | Gray Iron Founders Society, annual meeting, Chicago. |
| Oct. 27-28 | Porcelain Enamel Institute, annual meeting, French Lick, Ind. |
| Oct. 27-29 | American Society of Tool Engineers, semiannual meeting, Montreal. |
| Oct. 30- | National Tool & Die Manufacturers Assn., annual meeting, |
| Nov. 2 | New York. |
| Oct. 31- | American Institute of Steel Construction, annual convention, |
| Nov. 3 | White Sulphur Springs, W. Va. |

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"Refreshing"

THE report of the Steel Fact Finding Board is a surprising and refreshing document dealing with a domestic issue of "paramount importance." The report contains ample internal evidence to refute the suspicions entertained by many, including this writer, that the board had been stacked, with instructions to bring in a verdict for labor. Even though its reasoning at points and a number of its premises are open to question, it reveals, on the whole, economic thinking of a high order.

On at least three counts the board sustains its integrity as a quasi-judicial body. In the first place, it rejected a number of key "facts" offered by the advocates of the union case. It did not accept the contention that the breakeven point of the industry, under present conditions of price and cost, was 32 pct of capacity. Nor did it accept the claim that productivity had risen 49½ pct since 1939. Similarly, the strained demonstration of allegedly exorbitant steel profits was waved aside.

More important, however, than the rejection of such factual items in the labor case was the board's treatment of union theories calling for an increase in wages at the present time. Using the alleged increase of 49½ pct in productivity, the union braintrusts asserted that the worker had a first claim on this increase. Here the board laid down the sound principle that "any excesses of productivity in any one industry over the general average should provide primarily the means of reducing the prices of the products of that industry."

In making this statement, the board ran full tilt into one of the basic assumptions of organized la-

bor, namely, that the primary stimulant to business comes from consuming power, which in turn rests on wages. Under this theory, labor has made extravagant claims for compensation, arguing that such special benefits were not selfish, that high labor costs are in fact the keys to prosperity. To this the board answers that increased buying power also comes from lower unit costs and, insofar as superior technology contributes to such lower costs, the first benefit should go to the consumer.

The board, however, is not altogether consistent in pursuing this thinking. In discussing social security and pensions, it moves over into bed with the theorists of labor. Such benefits, it says, "will make a considerable contribution to the attainment of the economic stability so necessary at this time . . ." and ". . . will . . . help sustain consumption spending at a high stable level."

The recommendations of the board covering social security and pensions total \$200 per year per worker. On its own figures, this burden is just a little less than half the earnings left to the owners of the steel industry after meeting all other costs and charges. They are just as effective in preventing lower steel prices as direct increases in wages.

Considering the auspices under which it was appointed, the board showed distinct courage in turning down completely the demand for a fourth round of wage increases.

Finally, in its exposition of collective bargaining and its comment on industry-wide negotiations, it mildly reproaches the White House and confirms the tribute to its own intellectual integrity which the report as a whole constitutes.

Publishes Malleable Manual

Cleveland—An outstanding job has been done by The Lake City Malleable Co., Cleveland, in a recently published 92-page manual of their "SHOCK PROOF" malleable castings.

Getting away from the formal type of product presentation, humorous illustrations in color scattered throughout the manual point out the outstanding qualifications of malleable. The light touch has been given by the company without sacrificing good, meaty information about their product to engineers designers, teachers and students of engineering, to whom the book is dedicated.

Readable not only from the standpoint of layout and type, the manual is packed with solid, technical information.

ECA Booklet Aids Exporters

Washington—The Economic Cooperation Administration has issued a new booklet designed to assist American small businessmen who plan to enter the export market under the Marshall Plan.

Entitled "The ECA and Small Business," the booklet explains the various methods of organizing for overseas trade, listing the advantages and disadvantages of each method. Also, it directs the small businessman to sources of helpful information and guidance.

Expands Coal Research Lab

Pittsburg, Kan.—McNally Pittsburg Mfg. Corp. has started construction of a new coal research laboratory here. When completed in November, it will add 4500 sq ft to current floor space.

Giant Transformer to Be Built

Pittsburgh—Scheduled for delivery in 1951 is the world's most powerful portable electric transformer, rated at 83,333 kva, to be built by the Westinghouse Electric Corp. at its Sharon, Pa., works.

KENNEDY OWEN SOUND, ONTARIO, CANADA

builds heavy industrial machines and machine components of U. S. design for Canadian trade and export.



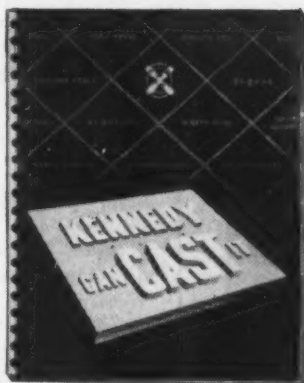
In the twenty-four pages of this book is presented a comprehensive description of our engineering, foundry and machine production facilities.

We are prepared to undertake, on contractual bases, the building of certain machines, equipment or machine components to supply the Canadian market, or for export.

Our engineering experience, production facilities and contact with major Canadian industrial concerns has proved of considerable value to those companies we now serve in our machine construction division.

Your investigation of Kennedy facilities may lead to the establishment of an equally satisfactory method of supplying Canadian industries with your machines or equipment.

The capacity and capabilities of our steel and manganese bronze foundries are illustrated and described in this, another book of twenty-four pages.



—The Wm. Kennedy and Sons, Limited, are licensees and sales representatives of THE FALK CORPORATION, Milwaukee, Wis.; licensees for tubular casting by the centrifugal process of SANDUSKY FOUNDRY AND MACHINE CO., Sandusky, Ohio; manufacturing and sales representatives of MORDEN MACHINES COMPANY, Portland, Ore., and of F. W. ROBERTS MANUFACTURING CO., INC., Lockport, N. Y.

These books are available to those definitely interested in availing themselves of Kennedy service.

Established 1857



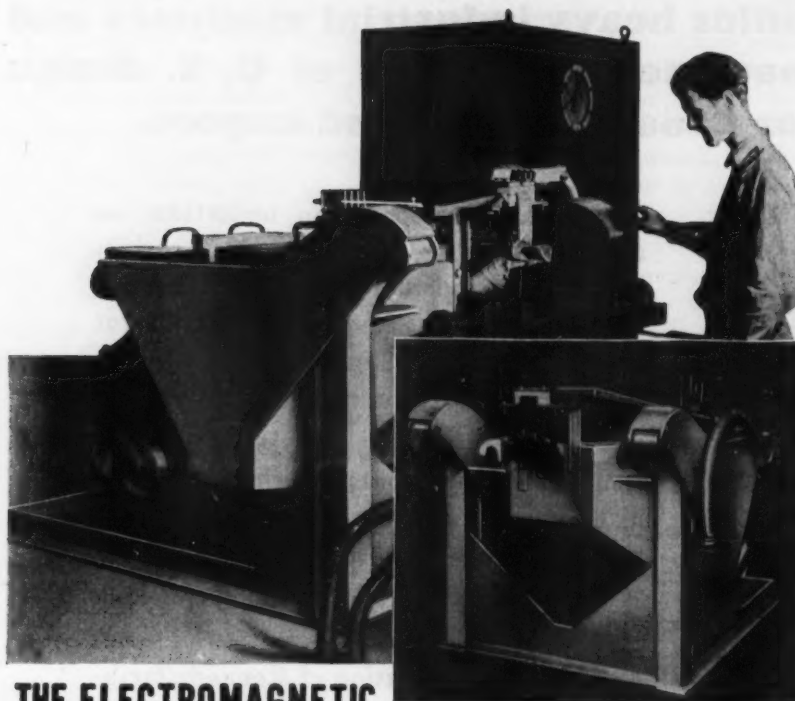
THE WILLIAM KENNEDY & SONS LIMITED

OWEN SOUND, ONTARIO
CANADA

STEEL FOUNDRIES AND ENGINEERING WORKS

AJAX

Push-Button Control OF MOLTEN METAL



THE ELECTROMAGNETIC MOLTEN METAL PUMP* BY AJAX

The Ajax-Tama Electromagnetic Pump is used in "around-the-clock" operations at the assembly lines of a number of prominent plants in the United States for the mass production of high precision aluminum alloy castings.

Using electromagnetic pressure created by high current in the loop of an Ajax Twin Coil Unit, the molten metal is automatically controlled and channeled in one direction. From the bottom of the hearth (see cross section drawing) through an electrically heated refractory pipe, the pure metal is lifted to the mold. The flow is completely controlled by electric current.

Maintaining excellent weight accuracy, castings of from 1/4 to 30 pounds, or more, can be poured in continuous operation. Special problems calling for a flow of hundreds

The large photo shows the Ajax-Tama Electromagnetic Pump at work. Control cubicle in rear maintains temperature, energizes pump from electric timer, electric eye, or similar devices.

Photo at right: Closeup of the pumping unit.

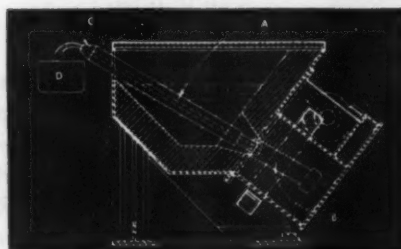


Photo above: A cross section of unit showing discharge pipe (A), induction channel where pressure is created (B), pouring spout (C), and mold (D).

of pounds per minute can also be handled by this same unit. The electromagnetic pump can be used as a reservoir to maintain molten metal at constant, accurate temperatures . . . for complete information contact Ajax.

*Patents applied for and allowed.

AJAX ENGINEERING CORPORATION, TRENTON 7, NEW JERSEY

AJAX

TAMA-WYATT



INDUCTION MELTING FURNACE

Associate Companies: **AJAX METAL COMPANY**, Non Ferrous Ingot Metals and Alloys for Foundry Use
AJAX ELECTROTHERMIC CORP., Ajax-Burkhard High-Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax-Hullgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting

Iron Age *Introduces*

Continued from Page 25

P. L. Edmonds, who has been associated with ARCOS CORP. since 1944 in testing and field engineering work, has been transferred to the New England district office and will be the Arcos field engineer in the Boston, Providence and Worcester areas.



JOHN G. BENJAMIN, sales manager, The Abbott Ball Co.

John G. Benjamin has been named sales manager of THE ABBOTT BALL CO., Hartford, Conn. He succeeds J. M. Taylor who has resigned. Mr. Benjamin will be in charge of sales for both the bearing ball and burnishing divisions.

Hendley Blackmon, managing editor of "Electrical World," has been appointed assistant manager of engineering association activities for Westinghouse. He will be headquartered at the East Pittsburgh works. Bernard F. Langer becomes manager of structural and heat engineering in the corporation's atomic power division. Erling Frisch is manager of control engineering in that division.

C. J. Moore has been appointed manager of the railway and motive power sales division of THE ELECTRIC STORAGE BATTERY CO. of Philadelphia. Mr. Moore worked his way through the ranks in sales supervision at both the Pittsburgh and



Cold-rolling crown-rolled strip accurately, in Bliss 3 stand, 2-high mill.

How BLISS Put Extreme Capacities into a Precision Mill

HERE'S THE RECORD of this 3 stand, 2-high mill engineered and built by Bliss for a leading steel producer.

A 50% average reduction in a single pass; accurate cold-rolling and finishing of stainless and special alloys within .001" overall; round-the-clock operation, week in, week out, at speeds up to 600 ft. per minute.

Controlled tension on pay-off reel and precision machining of all fitted parts—all work for the utmost in accuracy. Sturdy construction throughout guards its precision at extreme capacities. From the roller's control panel, there's coarse and fine rheostat control for instantaneous adjustment of tension, and special

bearing pressure gages and controls to minimize bearing wear and roll-neck stresses. A special speed control holds size while reducing speed.

Here's another case example of how Bliss engineering works to improve the rolling of hot and cold rolled strip to rigid specifications. Bliss builds a complete line of rolling mill equipment: 2-, 3-, and 4-high mills for ferrous and non-ferrous metals, single stand reversing or tandem operation, cluster mills and complete accessories.

For maximum rolling mill efficiency, it will pay you to put your problem up to Bliss. A trained sales engineer will go into it thoroughly with you.



E. W. Bliss Company

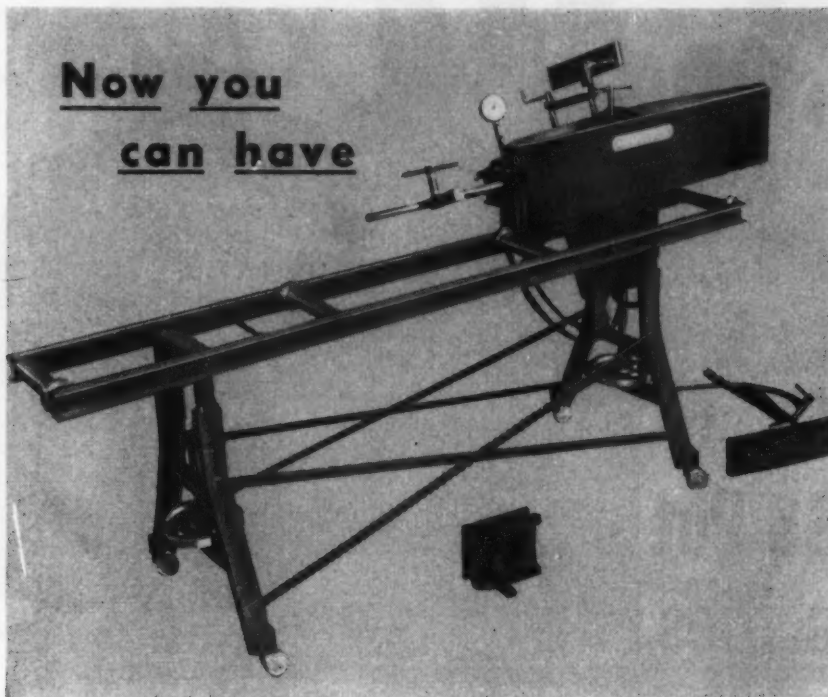
General Office: Toledo 7, Ohio

Rolling Mill Division

Salem, Ohio

One of two new Bliss 2-high mills for temper rolling installed in the same plant.

**Now you
can have**



**an Economically priced
Automatic Bar Feeder
for your Band Saw . . .**

**Wells-O-Bar
FEED MASTER**

Owners of Wells No. 8 and No. 12 Machines or other horizontal metal cutting band saws can now convert these units into fully automatic bar stock cut-off machines at very modest cost. The new Wells-O-Bar Feed Master accurately feeds bar stock in a variety of shapes and sizes into the machine and automatically controls the saw frame through each cutting and resetting cycle. Requires only 60 to 80 pounds air pressure. Safety features eliminate necessity of constant attention. Precision made by the world's foremost manufacturer of horizontal metal cutting band saws, the Wells-O-Bar Feed Master improves blade efficiency and slashes multiple cutting costs. Write for details and prices.

For your convenience and full satisfaction be sure to specify a Wells No. 8 or No. 12 Saw completely equipped with a Wells-O-Bar Feed Master. Illustration shows Wells-O-Bar Feed Master in use on Wells No. 8. It's quick and easy to install on your horizontal metal cutting band saw, too.



See this unit in action
at the Metal Show



Products by Wells are Practical
**METAL CUTTING
BAND SAWS**

WELLS MANUFACTURING CORPORATION
202 WASHINGTON AVE., THREE RIVERS, MICH.

IRON AGE INTRODUCES

Continued

Philadelphia branches of the company. C. H. Leet is manager of the Exide Pittsburgh branch. Prior to entering the service of the company, Mr. Leet was employed by General Electric.



VERNON H. PATTERSON, development staff, Climax Molybdenum Co.

Vernon H. Patterson, formerly sales metallurgist of American Brake Shoe Co., has joined the development staff of CLIMAX MOLYBDENUM CO. at Detroit.

F. Penn Holter has become manager of manufacturing in the construction materials department, GENERAL ELECTRIC, Bridgeport, Conn. Mr. Holter joined the company as assistant manager of manufacturing this year. E. J. Harrington, whom he succeeds, has been assigned to the staff of the vice-president in charge of manufacturing policy.

Joseph Graziano has been named assistant manager at the Newark facility of Federated Metals Division, AMERICAN SMELTING AND REFINING CO., New York. Mr. Graziano has been with the division 19 years, advancing through the ranks from his first position as office boy to his latest post.

William C. Howard and Walter B. Foreman have been appointed field engineers by NORTON CO., Worcester, Mass. Mr. Howard will cover the Connecticut district, with headquarters in Hartford. Mr. Foreman,

At Last! A WIRE ROPE HANDBOOK

FOR THE MAN ON THE JOB!

It's new . . . It's different . . . It's easy to understand

J&L STEEL

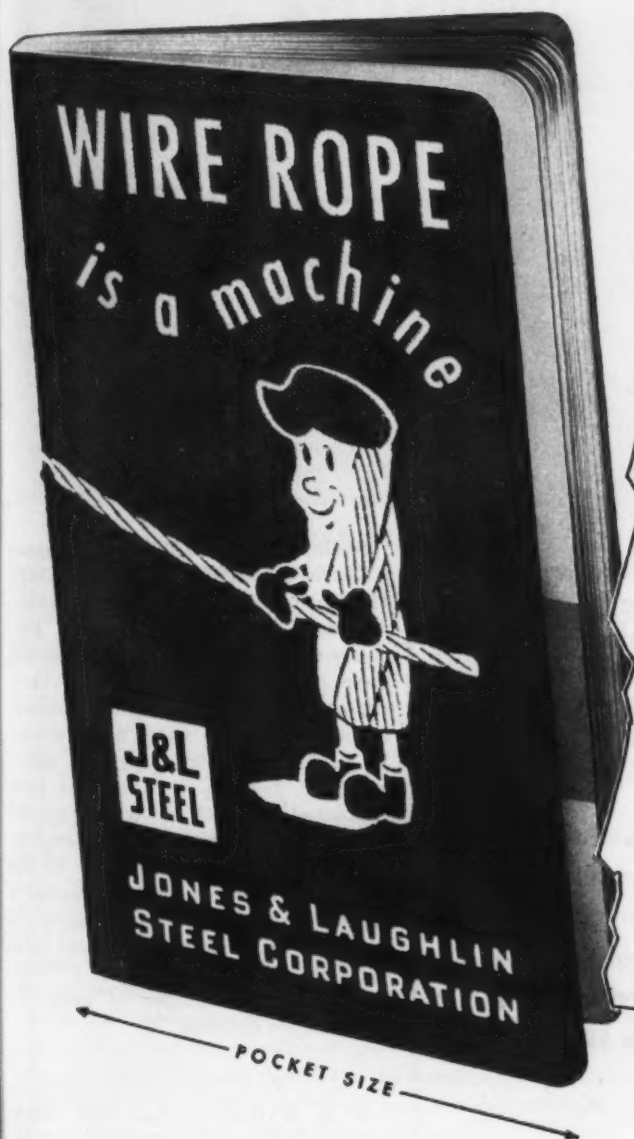


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SEND FOR YOUR COPY NOW!

Jones & Laughlin Steel Corporation
403 Jones & Laughlin Building
Pittsburgh 19, Penna.

Gentlemen:

Please send me a free copy of your new handbook "Wire Rope is a Machine."

Name _____

Company _____

Address _____

JONES & LAUGHLIN STEEL CORPORATION

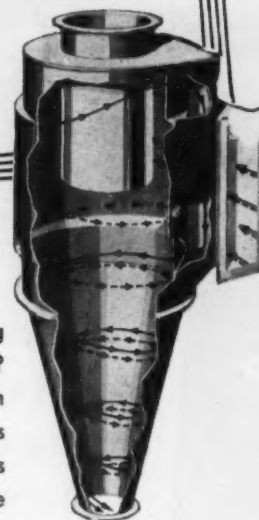
From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY and JALLOY (hi-tensile steels).

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

September 22, 1949

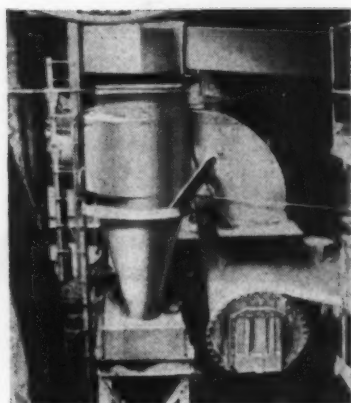
Now...

a Dust Collector that Cleans Waste Gas Efficiently!



Are you concerned about the high cost of shutting down your waste gas boilers for frequent cleaning? At a ferro-manganese blast furnace, a Buell System has lengthened the interval between waste gas boiler cleanings from two to fourteen days. Yet gas in ferro-manganese operations presents one of the most difficult dust problems known.

Clogging, the most serious obstacle to cleaning high-temperature waste gas, is virtually no problem with a Buell System. Engineered split-duct manifolding prevents overloading one cyclone to the clogging point, while others loaf. Besides, there are no small, easily clogged ducts in these large cyclones. Yet the patented van Tongeren 'Shave-Off' produces much higher efficiency than is possible with ordinary cyclones.



Before this Buell System was installed, waste gas boilers had to be cleaned every two days. Now they are cleaned once every fourteen days.

The combined knowledge of Buell's engineering staff is at the disposal of anyone with a difficult dust problem. Write us your problem. Buell Engineering Company, 70 Pine Street, Suite 5065, New York 5, N. Y.

buell

Engineered Efficiency in
DUST COLLECTION

IRON AGE INTRODUCES

Continued

until recently a member of the company sales engineering department at the Worcester plant, will work in the Cleveland area.



SHELBY A. McMILLION, assistant to vice-president in charge of sales, Chicago Metal Hose Corp.

Shelby A. McMillion has joined CHICAGO METAL HOSE CORP., Maywood, Ill. as assistant to vice-president in charge of sales. Formerly with McGraw-Hill International Corp. as business manager of three export magazines, Mr. McMillion will devote himself to sales development. T. K. Wells, priorly regional sales-manager, bellows division, has been appointed assistant to vice-president in charge of sales. E. L. Hiter, formerly district sales manager at the New York office, has become manager of sales for the eastern division. A. W. McGuire, until now regional sales manager, expansion joint division, will serve as manager of sales for the western division.

E. R. Marble, Jr. has been transferred to the central metallurgical department as assistant to manager. James F. Orr succeeds him as plant superintendent, having risen to this post from his start as a chemist in 1935.

Elliott C. Paddock has been appointed to a newly-created post of vice-president in charge of sales at GRANTON & KNIGHT CO., Worcester, Mass. Since 1939 Mr. Paddock had served as general sales manager of

No. 95
of a
Series
of Typical
Installations

Sunbeam STEWART

THE BEST INDUSTRIAL FURNACES MADE

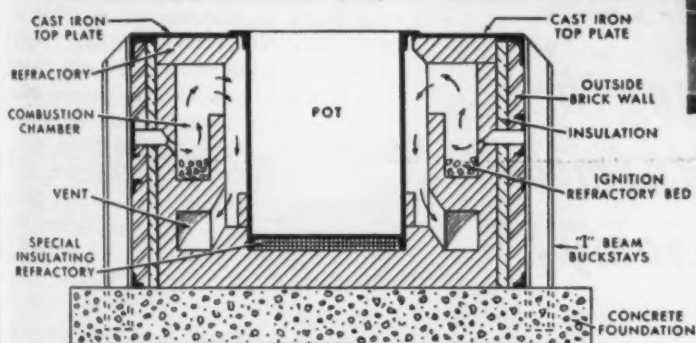
GALVANIZING WATER HEATERS

At A. O. Smith Corporation, Kankakee, Illinois, Works



SUNBEAM STEWART

INDIRECT HIGH-SIDE FIRED (Gas) GALVANIZING SETTING



Improved design and correct engineering have made Sunbeam Stewart the leader for galvanizing equipment. Burners fire against a protective baffle and provide a uniform flow of hot combustion gases to the upper part of the kettle. The gases travel downward to a point slightly above the dross where they are exhausted. This principle of High-Side Firing provides close temperature control and even heat distribution. Available for gas or oil fuel. This type of design assures:

1. UNIFORM BATH TEMPERATURE
2. LOW DROSS LOSS
3. MAXIMUM PRODUCTION RATE
4. LOW FUEL CONSUMPTION
5. LONG KETTLE LIFE

Sunbeam Stewart Galvanizing Equipment at A. O. Smith is in operation 8 hrs. per day, plus, depending upon manufacturing schedules. 500 sets (shell, 2 heads, 1 flue) are processed per shift.

This is Number 95 in a series of typical installations showing how Sunbeam Stewart furnaces are helping manufacturers reduce their costs and keep themselves competitive. These installations also demonstrate the wide variety of specific requirements in the metal-working industry Sunbeam Stewart furnaces are designed to meet.

A. O. Smith is one of many satisfied users of Sunbeam Stewart galvanizing furnaces. Quality of work and low cost of maintenance and operation are key factors in Sunbeam Stewart's design that have proved their worthiness year after year. Users report dross loss as low as 5% and kettle life up to 6 years. If galvanizing is important in your manufacturing process, it will pay to consult Sunbeam Stewart. Designs are available for small or large production. We will be glad to submit ideas on how you can get more economical operation.

SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION

(Formerly CHICAGO FLEXIBLE SHAFT CO.)

Main Office: Dept. 110, 4433 Ogden Ave., Chicago 23 — New York Office: 322 W. 48th St. New York 19 — Detroit Office: 3049 E. Grand Blvd., Detroit
Canada Factory: 321 Weston Rd., So., Toronto 9

A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problems with you.



"VAN DORN

**Weldments
Feature—**

***Strength
Uniformity
Economy!"***

Yes, Van Dorn Weldments are widely known for their outstanding quality—for they are backed by Van Dorn's complete fabricating facilities . . . experienced design engineers . . . specially trained workmen . . . 77 years' experience in metal working.

Consult us about your requirements—no obligation, of course. The Van Dorn Iron Works Co., 2685 East 79th Street, Cleveland 4, Ohio.



***Send For* FREE WELDMENT BOOK**

● *Profusely illustrated; describes the many advantages of weldments, and Van Dorn's extensive facilities.*

IRON AGE INTRODUCES

Continued

Corbin Screw Div., American Hardware Corp., New Britain, Conn. For 15 years prior to 1939 he was field sales manager in charge of domestic sales for Greenfield Tap & Die Corp., Greenfield, Mass.



EDWARD S. STEIGNER, tubular products development engineer, The Youngstown Sheet and Tube Co.

Edward S. Steigner, a member of THE YOUNGSTOWN SHEET AND TUBE CO.'s metallurgical department for 15 years, has been appointed tubular products development engineer. In 1934 Mr. Steigner joined the company as a tester in the metallurgical department. Since then he has held company posts as metallurgist for tubular products and for flat-rolled products.

George L. Wheeler, formerly assistant purchasing agent of Wyeth Co., St. Joseph, Mo., has been appointed a sales representative of WHITE METAL MANUFACTURING CO., Hoboken, N. J. Mr. Wheeler will have his headquarters at Philadelphia.

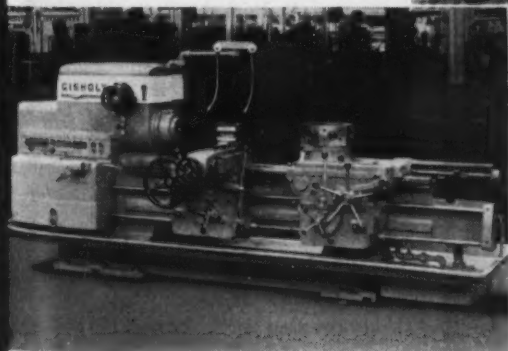
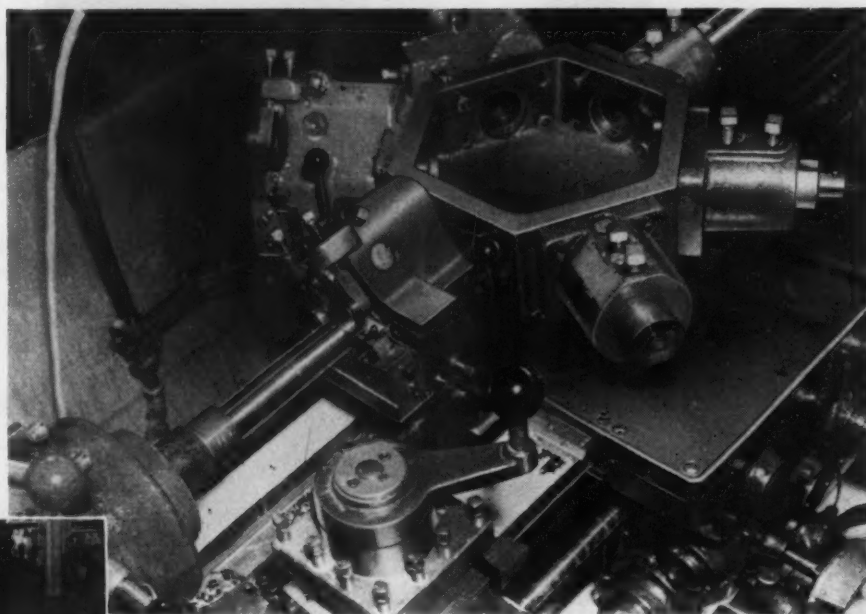
George V. Wise has become advertising manager of THE H. B. DAVIS CO., Baltimore. Mr. Wise was formerly sales promotional manager for the company. Before that he had been in charge of special sales promotional material for The Baltimore Sunpapers.

W. T. Richardson, formerly with Bethlehem Supply Co., Corsicana, Tex., has joined TEXAS ENGINEERING AND MANUFACTURING CO., INC. at Dallas, to head the TEMCO

*take shaft jobs
Like This:*

**they take less time on
GISHOLT TURRET LATHES**

*Yes, even in lots as small as
5 or 10 parts, you can't beat
turret lathes on this kind
of work. Parts are machined
complete in 2 operations—
total time is less than 4 min.*



no extra equipment needed!

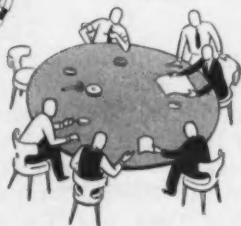
With no more than your standard bar equipment, you're all set to cut machining costs on shafts like these. No previous operations . . . such as cutting to length or centering . . . are necessary. And with *two or more tools* from turret and side carriage, you have the basic advantage of turret lathe economy—the time saving that means lower costs.

Before you turn to extra equipment or special attachments, look into the possibilities of doing the job the quick and easy way on Gisholt Turret Lathes. Gisholt engineers will gladly help you.

GISHOLT MACHINE COMPANY

MADISON 10, WISCONSIN

THE GISHOLT ROUND TABLE
represents the collective ex-
perience of specialists in the
machining, surface-finishing
and balancing of round and
partly round
parts. Your
problems are
welcomed here.

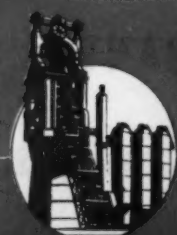


TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

positive*



* Positive action and positive seat are things you can be sure about when you specify BROSIUS Goggle Valves for your gas mains. And even if you only close it once a year, you can be positive that a BROSIUS valve will operate—smoothly, swiftly. BROSIUS new advanced design provides constant pressure on the valve seat open or closed, and a totally enclosed valve housing to prevent leaks to the atmosphere. Remember, the mark of BROSIUS stands for sensible blast furnace and steel mill engineering. Write to us.



Edgar E.
BROSIUS
Company Inc.

SHARPSBURG • PITTSBURGH 15, PA.

IRON AGE INTRODUCES

Continued

tool design department. Mr. Richardson, with a combined total of 20 years experience as a tool designer and tool and die maker, set up the tool design department for Bethlehem Supply. Harold W. Hickey, succeeded in his former post by Mr. Richardson, has returned to the TEMCO engineering department to assist on the T-35 Military Trainer program.



GEORGE A. POCKELS, director European operations, Clearing Machine Corp.

George A. Pockels is named to direct European operations for CLEARING MACHINE CORP., Chicago. His headquarters will be in Paris. Mr. Pockels' long association with the corporation and his intimate knowledge of presses will enable him to provide assistance to European manufacturers of metal products.

Marvin S. Bandoli will fill the newly-created post of vice-president in charge of sales and distribution at CLARY MULTIPLIER CORP., San Gabriel, Calif. Mr. Bandoli has formerly served the Victor Adding Machine Co., Chicago and the Kelvinator Division of Nash-Kelvinator.

Julian M. Girardeau has been promoted as district sales engineer in charge of the New Orleans office of THE INGALLS IRON WORKS CO., Birmingham. Girardeau will also represent subsidiaries, The Ingalls Shipbuilding Corp. and The Steel Construction Co., as well as The Birmingham Tank Co., division of Ingalls. Be-

IRON AGE INTRODUCES

Continued

fore his promotion, Mr. Girardeau was a sales engineer in the company's Birmingham office.

A. E. Purman has become Michigan representative for THE WELLMAN BRONZE & ALUMINUM CO., Cleveland. Mr. Purman established his own aluminum and magnesium foundry in 1941 and has been sales representative for a Detroit foundry in addition to his enterprise duties.

Thomas A. Kennally has risen to the post of president of the refrigeration division of PHILCO CORP., Philadelphia. He has had 25 years of experience in the development, manufacture and distribution of Philco products. W. F. Jones, formerly vice-president of the division, has resigned to accept the presidency of Servel, Inc., Evansville, Ind.

C. W. Floyd Coffin has been elected chairman of the board of directors of AMERICAN ARCH CO., New York. William F. Walsh, member of the New York law firm of Walsh & Levine, has been elected a director. Mr. Coffin is a vice-president and director of the Franklin Railway Supply Co. and a director of the Lima-Hamilton Corp. and the Balmar Corp.

OBITUARY

Wilbur B. Driver, 75, founder and board chairman of the Wilbur B. Driver Co., Newark, N. J., died recently.

James W. Chalmers, sales engineer at Wm. K. Stamets Co., Pittsburgh for 25 years, died Sept. 1.

Edward J. Skinner, 53, plant superintendent of Renown Stove Co., Owosso, Mich., died Sept. 1.

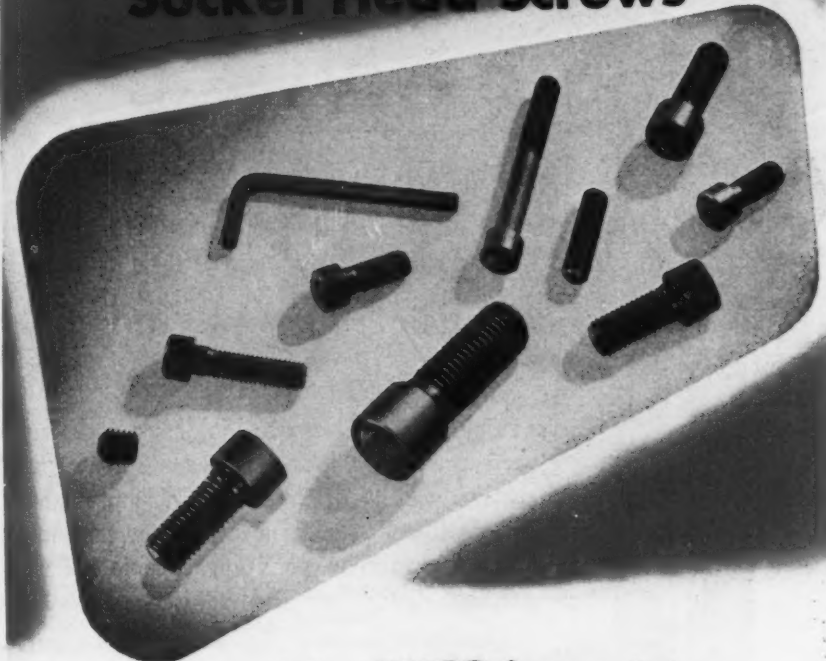
Homer D. Heman, 73, former vice-president, Ajax Manufacturing Co., Cleveland, died Sept. 7.

Arthur E. Ulrich, 58, sales executive of Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., died Sept. 8.

Daniel Campbell Bakewell, 61, vice-president, Blaw-Knox Co., Pittsburgh, died Sept. 10.

Resume Your Reading on Page 26

EXTRA fast cost-cutting assembly with Cleveland Socket Head Screws



made with **EXTRA** precision by the Kaufman Process

Fast assembly is vitally important in holding manufacturing costs low. It's a by-product of the *precision accuracy* of Cleveland Socket Head Screw forming and threading. But equally important is *extra strength*—the result of production by the Kaufman Double Extrusion Process in our plant. By this efficient cold-forging process, steel qualities are actually *improved*. And with modern heat treatment added, Cleveland Screws are extra tough—stand the strain of heavy tightening. It pays you to specify and buy Cleveland Socket Head Screws.

Write for our latest Stock List

THE CLEVELAND CAP SCREW COMPANY
2917 EAST 79TH STREET • CLEVELAND 4, OHIO
Warehouses: Chicago, Philadelphia and New York

CLEVELAND
Top Quality
FASTENERS

ORIGINATORS OF THE
KAUFMAN DOUBLE EXTRUSION PROCESS

Specialists for more than 30 years in
CAP SCREWS, SET SCREWS, MILLED STUDS
Ask your jobber for Cleveland Fasteners



the holder designed as a perfect corollary to this well-known formula...



11504-B

For complete line of WW quality welding supplies consult Weiger-Weed Bulletin 14.650. Send for it.

Weiger-Weed Electrode Holders can deliver more than enough cooling water for any resistance welding application using replaceable tips—without a sign of a leak! They are most dependable for long service, reduction of tip damage, down time and maintenance.

Quality to the same high standards is found in Weiger-Weed replaceable tips, seam welding wheels, projection welding dies, flash and butt welding dies and special alloy bars, forgings and castings. You are cordially invited to bring your resistance welding problems to Weiger-Weed. Long specialized welding engineering experience and every modern facility are at your service. Weiger Weed & Company, Division of Fansteel Metallurgical Corporation, 11644 Cloverdale Ave., Detroit 4, Michigan.

- 1 Hardened stainless steel knockout plug, and leak-proof water seal. Spring return assures free water ports and proper tip seating.
- 2 Non-rusting non-magnetic knockout tube.
- 3 Strong heavy body assures maximum conductivity, withstands heavy clamping pressure.
- 4 Hard alloy taper socket will not get out of round nor leak.



Resistance Welding ELECTRODES
DIES • TIPS • WHEELS • HOLDERS

FREE

PUBLICATIONS

Continued from Page 36

Power Control

Power control equipment including switchboards, relay panels, remote controls, flashers, registers, recorders, computers and special electronic controls are featured in folder. *Taller & Cooper, Inc.* For more information, check No. 13 on the postcard on p. 37.

Clutch Head Screws

Features and specifications of clutch head screws and drivers are described in 12-p illustrated catalog. *United Screw & Bolt Corp.* For more information, check No. 14 on the postcard on p. 37.

Lathe Chucks

Spindle nose lathe collet chucks, a set of 11 of which will replace a set of 88 conventional collets, and which have perfect parallelism, long bearing surfaces, and accurate and constant gripping power, are featured in bulletin 49-LC. *Jacobs Mfg. Co.* For more information, check No. 15 on the postcard on p. 37.

Steel Tubing

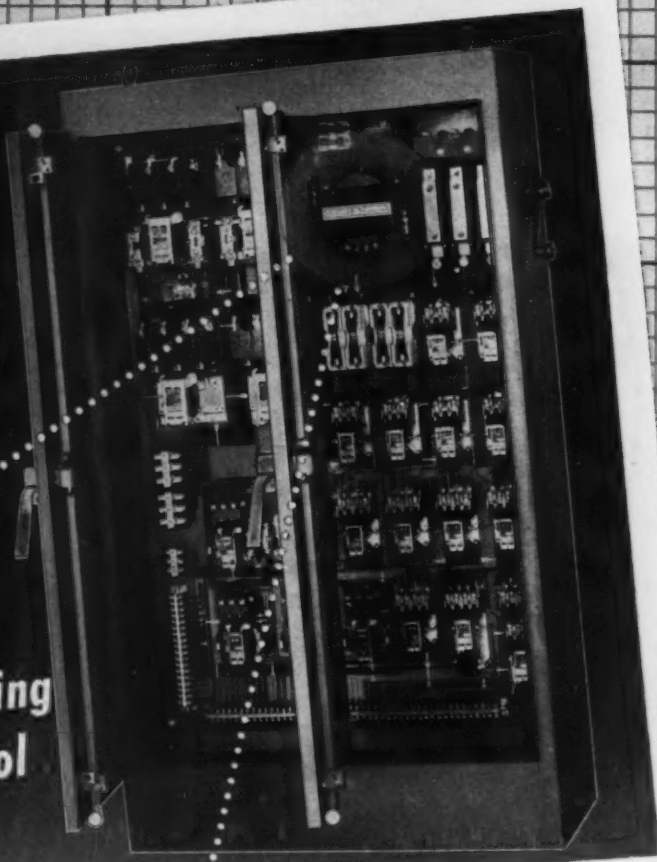
Fabricating and forging seamless steel tubing is the subject and title of technical handbook No. F-3, which explains and illustrates upsetting, spinning, variable walls, fluting and swaging. *Ohio Seamless Tube Co.* For more information, check No. 16 on the postcard on p. 37.

Forcing Presses

Catalog No. 315 describes stationary forcing presses of 100 to 600 tons, horizontal and inclined press frames of 75° or 90°, and portable presses of 100 and 200 ton capacity. *Rodgers Hydraulic Inc.* For more information, check No. 17 on the postcard on p. 37.

DESIGN LEADERSHIP

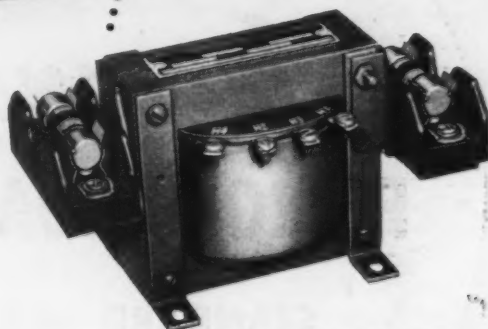
Another good reason for selecting
Square D Machine Tool Control



Square D's line of machine tool control is an ever-growing line—keeping pace with the expanding requirements of the machine tool industry. That's why practically any performance requirement can be met with a combination of standard Square D devices, every one of which is designed specifically for machine tool applications.

New Control Transformers a good example of Design Leadership

Rapidly growing demand for the low voltage safety element in motor control circuits has focused attention on the need for a transformer designed to supply A. C. magnetic starters, contactors and solenoids typical of such systems. Square D's new line of transformers meet that need—exactly.

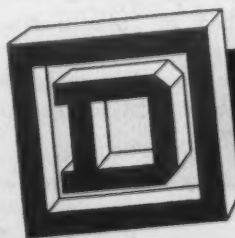


These features make it easy to meet Low Voltage Requirements

Lower Voltage Drop—unusually low impedance gives good regulation. Designed to handle the high inrush currents typical of A. C. magnets.

Secondary Circuit Protection—provided by easily adding Square D bracket and fuse block unit-assembly. One or two can be added to any of the transformer sizes—maximum flexibility with minimum stocking.

Dual-Voltage Primary—(optional) primary winding reconnectable for either 220 or 440 volts—required by "Automotive Standards."



Write for Bulletin 215...Square D Company, 4041 N. Richards St., Milwaukee 12, Wis.

SQUARE D COMPANY

DETROIT

MILWAUKEE

LOS ANGELES

SQUARE D COMPANY CANADA LTD., TORONTO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.

Anaconda

NODULIZED MANGANESE ORE

Manganese content
approximately 59%

Anaconda

FERROMANGANESE

STANDARD GRADE



Anaconda's production is the principal U. S. source of supply for metallurgical grade manganese ore.

ANA CONDA COPPER MINING COMPANY

Offices: 25 Broadway, New York 4, N. Y.

Anaconda, Montana

49352

FREE PUBLICATIONS

Continued

Steel Walls

Insulated steel walls and pre-fabricated wall panels are featured in catalog No. B-49-B. Included are detail drawings, typical installations and a comparison chart of insulated steel v. masonry construction. *R. C. Mahon Co. For more information, check No. 18 on the postcard on p. 37.*

Bearing Balls

Technical data on steel bearing balls, stainless steel balls, bronze balls, burnishing balls and tumbling barrel materials are given on data sheet. *Pioneer Steel Ball, Inc. For more information, check No. 19 on the postcard on p. 37.*

Speed Controls

Simplified, inexpensive variable speed control unit for light horsepower requirements is described and specifications and price lists are given in 8-p bulletin. *Reeves Pulley Co. For more information, check No. 20 on the postcard on p. 37.*

Air Diffusers

Bulletin No. 28 explains operation and application of air diffusers for projection unit heaters. Included are specifications and illustrations of various types. *Anemostat Corp. of America. For more information, check No. 21 on the postcard on p. 37.*

Load Binders

Four page bulletin shows ratchet type load binder that has a barrel length of 10 in., a takeup of 8 in. and weighs 13 lbs. *American Forge & Mfg. Co. For more information, check No. 22 on the postcard on p. 37.*

Milling Machine

Vertical milling machine for precision boring and locating is described in bulletin No. 40 which also shows accessories. *Index Machine Co. For more information, check No. 23 on the postcard on p. 37.*

Resume Your Reading on Page 37

QUESTION NO. 1: *which Twin uses*

ACCURATE PERFORATING?



THE ANSWER: *Accurate Aggie*
... the girl on the right.

Aggie has taken a tip from industry. She's learned that it pays to specify Accurate Perforating...for obvious reasons.

1. Lower cost
2. More efficient operation
3. Better, modern appearance.
4. Improved sturdiness
5. Functional design

Aggie knows that whether it's large holes or patterns so small they are invisible to the naked eye, Accurate Perforating can handle the job efficiently, economically. AND Accurate perforates practically any material, metallic or non-metallic—steel, copper, brass, lead, iron, tin plate, masonite or cardboard. The sheet of Accurate perforated material Aggie holds so modestly before her might eventually be used for anything from building construction to the fine grill of a television set.

Accurate perforated materials are doing a job of economy and performance for hundreds of manufacturers. On your next job, take advantage of the hundreds of stock dies, engineering consultation, special die service, know-how and precision available to you through Accurate Perforating.

Send sample of perforating you are now using and we will submit quotation.

Send for **FREE** Catalog Today

Send for Accurate's free catalog today. Just fill in the coupon, attach to your letterhead and mail to Accurate Perforating Co. Receive with our compliments, your 11"x14" print of Accurate Aggie, ready for framing.

ACCURATE PERFORATING COMPANY

KEDZIE and FILLMORE • CHICAGO 12, ILLINOIS

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Accurate Perforating Co.
Kedzie and Fillmore • Chicago 12, Illinois
Gentlemen:
Please send me free catalog and 11" x 14" print
of Accurate Aggie that tells all, shows all.
Name _____
Company _____
Address _____
City _____ State _____
Title _____

GERSTEL-LOEFF ADV. CHICAGO

September 22, 1949

Standard for Industry

SINCE 1899



Kester is constantly developing new and better flux-core solders. At present there are over 100,000 types and sizes, each designed to do a certain job in the most efficient manner.

Take advantage of Kester's highly specialized Technical Service. Call in a Kester technical engineer today and let him specify the solder that will enable you to do your soldering faster and better.

Free—Technical Manual

Send for Kester's new 28-page manual, "SOLDER and Soldering Technique" . . . a complete analysis of the application and properties of soft solder alloys and soldering fluxes.

KESTER SOLDER COMPANY

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Factories Also At

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KESTER SOLDER

NEW

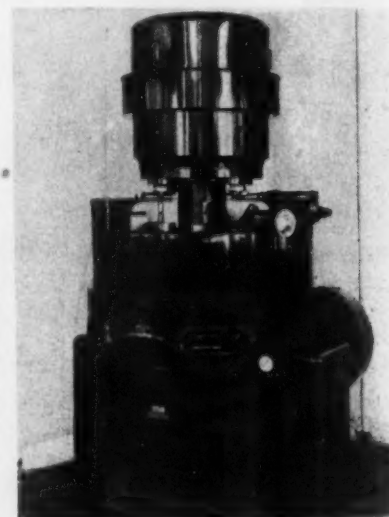
PRODUCTION IDEAS

Continued from Page 40

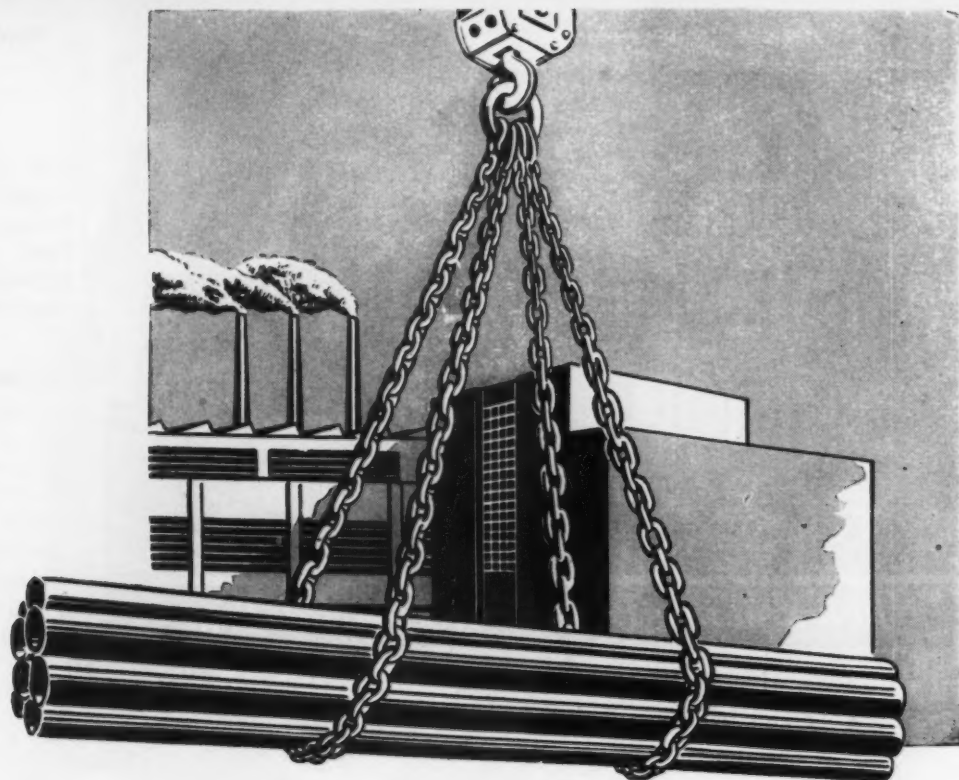
mounted on the crankshaft. AM gears and other drive parts rotate continuously. *E. W. Bliss Co.* For more information, check No. 36 on the postcard on p. 37

Vertical Lathe

Compactness and versatility are features of the new Baird No. 54 four-spindle vertical continuous lathe. Dimensions are 42 $\frac{1}{2}$ x 59 $\frac{3}{4}$



in. and overall height is 76 in. By making the machine continuous in operation, the indexing mechanism is eliminated. Each spindle has its individual set of cutting tools and alternate spindles can be set up to machine two different sized pieces. The machine illustrated face mills the shank of a slip yoke and chamfers the hole. Productivity of the machine is 450 pieces per hr of each size. With cutting time 4.1 sec, a work spindle speed of 496 rpm and a work stroke of $\frac{1}{4}$ in., the performance figures are: 0.0076 feed per revolution and a cutting speed of 213 fpm for the end facing, 160 fpm for the chamfering. Stock removal is $\frac{3}{32}$ in. Loading and unloading is facilitated by the positioning of the work spindle, and the holding fix-



Put yourself in his shoes — safely

Five tons of steel overhead . . . a wife and three children at home. It's a familiar scene every day in many plants.

But are you providing as much protection for the man below as you would want—in *his shoes*?

When sling chains are Cleveland made, you know there's absolute protection against sudden breakage. For Cleveland Sterling Grade Sling Chains are hand forged by craftsmen from double refined, puddled wrought iron.

Every Cleveland chain passes rigid tests before shipment. The certificate of test with each chain says *dependability*. It's your assurance of proved resistance to shock loads.

Next time you order sling chains, specify Cleveland Sterling Grade. And remember—National Safety authorities give this chain *the highest margin of safety rating*.

P & P-5000

CLEVELAND CHAIN

THE CLEVELAND CHAIN & MFG. CO.

Cleveland 5, Ohio

Associate Companies: David Round & Son, Cleveland 5, Ohio
The Bridgeport Chain & Mfg. Co., Bridgeport 1, Conn. • Seattle
Chain & Mfg. Co., Seattle 8, Washington • Round California Chain
Co., So. San Francisco and Los Angeles 54, California. • Wood
house Chain Works, Trenton 7, New Jersey.

A STYLE FOR ANY TYPE OF HEAVY DUTY LIFTING

• Cleveland Sterling Grade Sling Chains are available with single . . . double . . . 3-way or 4-way slings.

Fittings include rings . . . sling or grab hooks . . . pear-shaped links. Cleveland fittings more than equal chain strength—for greater safety . . .




Since



1869

UP goes
material-handling
efficiency




when you use Battery Industrial Trucks

Greater efficiency in material handling means greater earning power in any plant. Start paring unnecessary moves for production hands or warehouse men and you not only reduce handling cost per unit, but make way for volume never before possible.

Battery industrial trucks are the dependable, economic means of obtaining such efficiency. They can perform their strenuous tasks 24 hours a day every day if required, and their power characteristics are outstanding: instant starting; quiet operation; no fumes; no power used during stops. Driven by electric motors, they have a minimum of wearing parts and are inherently trouble-free.

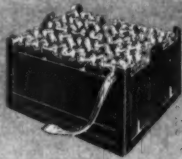
Keeping these hard-working trucks on the job calls for EDISON Nickel-Iron-Alkaline Batteries. Built of rugged steel, yet precise as a watch, they are recognized for dependability, long life and trouble-free operation. Specify EDISON and you specify maximum reliability—enduring quality.

ADVANTAGES OF EDISON NICKEL-IRON-ALKALINE BATTERIES:
They're mechanically durable; electrically foolproof; quickly and easily charged; simple to maintain; not injured by standing idle.



EDISON

Nickel • Iron • Alkaline
STORAGE BATTERIES



EDISON STORAGE BATTERY DIVISION
of Thomas A. Edison, Incorporated, West Orange, N. J.
In Canada: International Equipment Co., Ltd., Montreal and Toronto

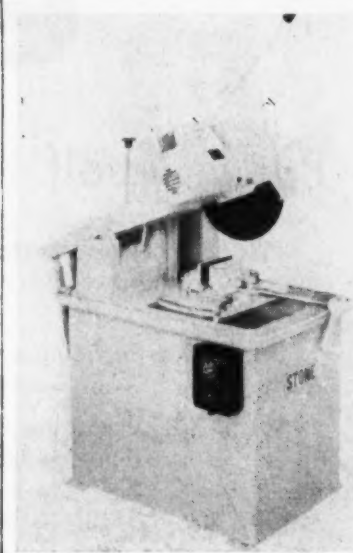
NEW PRODUCTION IDEAS

Continued

ture that swings out. Coolant is supplied from a tank or a centralized system, by manifold piping *Baird Machine Co.* For more information, check No. 37 on the postcard on p. 37.

Metal Cut-Off Machine

Positive drive, flexibility and ease of operation are features of the new Swing-Cut abrasive metal cut-off machine. Capacity cuts up to 3-in. solids and 4-in. pipe in ferrous and nonferrous materials are obtained through the elimination of all belt drives with a 5 hp geared-in-head motor. A fast act-



ing self-centering vise mounted on a swivel plate, provides speedy change from straight or 90° cutting to any desired angle. The balance of the machine head is accomplished through spring load control. Maximum wheel diameter is 16 in. *Stone Machinery Co., Inc.* For more information, check No. 38 on the postcard on p. 37.

Stud Welder

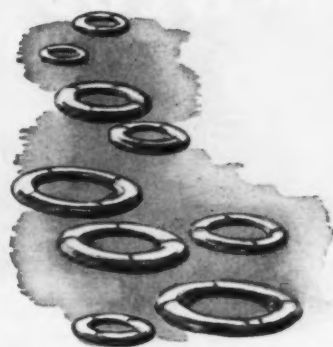
The basic principle of a new single gun welder is a capacitor-operated, self-timed device using tip studs that, on coming in contact with the work and fusing, causes ionization. This, in turn, allows a path for the main discharge current of the capacitor to form an arc sufficient to melt both



CHASE WIRE IS COILED ESPECIALLY FOR YOUR NEEDS!

GETTING the *right* size of wire coil is no small matter when it comes to meeting production schedules . . . when it means the difference between a smooth-running operation and a cumbersome one. That's why Chase makes it their business to *supply* you with the coil size best adapted to *your* needs.

It's another example of the extent of Chase service. Add to this the fact that Chase quality is unparalleled in the industry, that Chase regularly makes wire in 22 different alloys to suit your every need . . . and you can see the advantages of dealing with the nation's largest network of brass and copper warehouses and offices!



Chase



the Nation's Headquarters for
BRASS & COPPER

WATERBURY 20 CONNECTICUT

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

THIS IS THE CHASE NETWORK . . . *handiest way to buy brass*

ALBANY! ATLANTA BALTIMORE BOSTON CHICAGO CINCINNATI CLEVELAND DALLAS DETROIT HOUSTON INDIANAPOLIS KANSAS CITY, MO. LOS ANGELES MILWAUKEE
MINNEAPOLIS NEWARK NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH PROVIDENCE ROCHESTER ST. LOUIS SAN FRANCISCO SEATTLE WATERBURY *(Sales Office Only)*



"What's so good about H-VW-M CLEANERS?"

THOMAS M. RODGERS
H-VW-M Field Representative
Philadelphia Office

"Now there's a man who wants facts," I thought, when a customer popped that question at me. It so happens that of all the H-VW-M items of electroplating

and polishing equipment I handle, the "cleaners story" is one of my favorite subjects:

"As we both know," I started, "absolutely clean metallic surfaces are a prerequisite for successful electroplating and anodizing. Poor adhesion, porosity, blisters and other faults in final finishes can usually be traced to inadequate cleaning. In addition, you've got to consider such factors as attack on metals, emulsifying power, electrical conductivity, chemical stability and service life of the cleaning agent.

"No one cleaner can do all jobs equally well," I hastened to point out, "and that is where H-VW-M's long years of experience in solving metal cleaning problems come in. Before recommending a cleaner we analyze pre-cleaning, cleaning and plating operation . . . consider type of materials to be removed after buffing and polishing . . . surface conditions . . . packing in recesses . . . effect of stacking. We also check base metal being used . . . whether D. C. or R. C. is required and whether cleaning operations passive or activate."

For full information on our cleaners, you'll always find a H-VW-M representative ready to recommend the right cleaner for the job . . . or you can write direct to "Headquarters" for Bulletin C-105.

HANSON-VAN WINKLE-MUNNING COMPANY

MATAWAN, NEW JERSEY

Manufacturers of

a complete line of electroplating and polishing equipment and supplies

Plants: Matawan, New Jersey • Anderson, Indiana

Sales Offices: Anderson • Chicago • Cleveland • Dayton • Detroit
Grand Rapids • Matawan • Milwaukee • New Haven • New York • Philadelphia
Pittsburgh • Rochester • Springfield (Mass.) • Stratford (Conn.) • Utica



"Hanson-VanWinkle-Munning has supplied the plating industry for over 70 years. Our sales-engineers are thoroughly familiar with every step in the process of electroplating and polishing. It is this overall knowledge that has made H-VW-M "Headquarters" for electroplating and polishing equipment, supplies and technical assistance.



5861

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TO DO THE JOB

THE WEBB PLATE BENDING ROLL



Built in Two Types, Initial Pinch and Pyramid. Complete Range of Sizes and Models.

Prompt Delivery on Standard Sizes

Webb Plate Bending Rolls are designed and built for the forming of cylindrical shapes from rolled steel plate with greater speed and accuracy for high quantity production.

All Webb Rolls are backed by continuous progress in the development of industrial machinery since 1881.

Write for Catalog

MANUFACTURERS OF PLATE ROLLS, COMBINATION PUNCH & SHEARS.

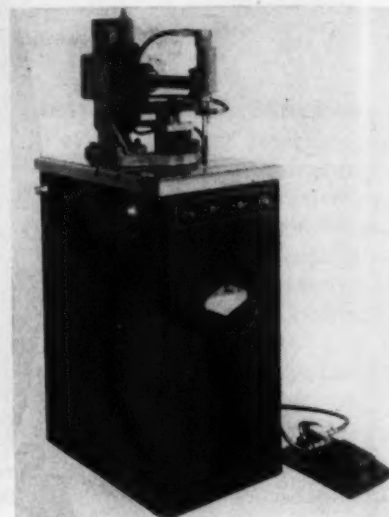
Industrial Weighing Equipment

THE **WEBB** CORP.
WEBB CITY, MO.

NEW PRODUCTION IDEAS

Continued

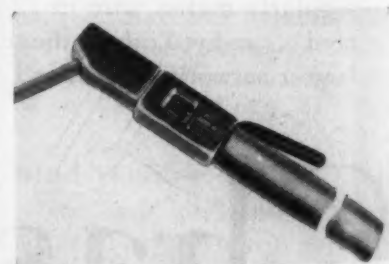
the full diameter of the stud end and the workpiece directly under it. This is followed by the hammer blow causing the pieces to



weld. Short arc time makes possible the use of very high currents. Resultant advantages include: concentration of heat, welding of studs on very thin metal, no fillets, no distortion of work, studs welded on back of plated or painted surfaces, no flux necessary, and welding dissimilar metals. Stud dimensions are up to 1/2 in. Current rating is ac 110/220/440 three phase. Graham Mfg. Corp. For more information, check No. 39 on the postcard on p. 37.

Electrode Holder

A new heavy duty electrode holder welds with 3/8 in. electrodes at 600 to 700 amp under continuous



duty cycle without discomfort to the operator's hand, it is reported. Rods are held by a bulldog cam action grip, at 60° or 90° position. The cam action gives a positive

Turn to Page 146

Dear Editor . . .

CAST PIPE

A prominent Austrian manufacturer is interested in centrifugal steel casting. While we are familiar with centrifugal casting of gray iron, the equipment used for cast steel has not come to our attention. It is intended to obtain by such centrifugal casting processes dense steel rings with a diameter of 50 to 85 in. and favorable properties with respect to uniformity of structure, tensile strength and ductility. We have been unable, to date, to obtain the required information and would appreciate your suggestions as to where we might obtain it.

A. GIESL
Chief, Industrial Div.
Austrian Legation, ERP Office
Washington

There are a number of firms in the U. S. manufacturing centrifugal cast steel pipe, but most of it is of a maximum diam of 20 to 24 in., Watertown Arsenal and others have, however, cast larger diameters. There have been instances where pipe of 50 and 60 in. OD has been centrifugally cast. The names of the foundries that have done this type of work has been sent to you, as well as a list of articles appearing in THE IRON AGE that you may find useful. Other sources from which you may obtain additional information have also been enclosed.—Ed.

HOT MACHINING

I understand that the Navy Dept. has done work on heating steel before machining to increase the rate of chip removal, and that a report on this work has been published in THE IRON AGE. Would you please send me a copy of the article.

W. WALLACE KRAIG
Cumberland Steel Co.
Cumberland, Md.

The article you refer to is entitled "Hot Spot Machining," and appeared in the July 21 issue. A copy has been sent.—Ed.

TRADE NAMES

Please send me a copy of "Directory of 10,000 Trade Names," for which payment, \$3.00, is enclosed.

N. V. HAMMET
Marketing Dept.
Esso Standard Oil Co.
New York

CENTRIFUGAL CASTING

As a senior mechanical engineering student at the University of Toronto, I am writing a thesis on "Centrifugal Casting." The information I have been able to find so far has been

meager and I would appreciate it if you would send some tearsheets or reprints of articles from THE IRON AGE.

SYDNEY H. GRANT
London, Ontario

Tear sheets and reprints of several articles that may be of interest have been mailed, in addition to a bibliography of other articles from IRON AGE of which we have no tear sheets available. The library at the University has been a regular subscriber and you will find more information in their files.—Ed.

COLD TREATMENT OF STEEL

Would it be possible for us to obtain copies of the articles which you have published concerning the quenching of steels through the use of subnormal or deep freeze methods. In addition, if you know of any printed articles having to do especially with cold treatment of high carbon, high chrome steel for cutlery purposes, or if you should happen to publish such an article in the future, we would like to be appraised of it.

C. H. CORBIN
Treasurer
Ontario Knife Co.
Franklinville, N. Y.

Copies of articles dealing with the use of cold treatment of steel in general have been mailed. You might write to one of the manufacturers of low temperature refrigerators for industrial cold treatment for further information.—Ed.

BRAZING ALUMINUM

We would appreciate very much receiving a copy of your article "Furnace Brazing Aluminum Refrigerator Parts" appearing in the May 26, 1949, issue.

A. A. ULLMAN
Superintendent of Plant Engineering
Servel, Inc.
Evansville, Ind.

PRECISION CASTING

Please send me your booklet entitled "Precision Casting." Enclosed is payment to cover costs.

LLOYD W. MORRIS
Professor of Physics
Louisiana State University
Baton Rouge, La.

TOOL STEEL

For some time now, we have been using and distributing copies of your chart "Comparative Tool Steel Brands." We find this chart to be extremely useful in our work and understand that additional copies may

be procured for 15¢ each. Please send us several copies, payment for which is enclosed.

H. E. WALTHER
Alloy Dept.
Joseph T. Ryerson & Son, Inc.
Philadelphia

STEEL CONSUMPTION

Will you please send a copy of your detailed report on steel consumption by the metalworking industry in 1948.

ROBINSON NEWCOMB
Executive Office of the President
Council of Economic Advisors
Washington

VANADIUM PENTOXIDE

We manufacture fused vanadium pentoxide and would like to know if you have a list of steel firms, especially those manufacturing vanadium alloy steels, so that we may get our product distributed.

WALTER E. DALEY
President
Alloys, Inc.
West Haven, Conn.

Suggest you secure a copy of "Directory of Iron & Steel Plants" from Steel Publications, Inc., Pittsburgh 30. This directory gives brief description of equipment and products of each plant along with a list of names of top officials.—Ed.

BEER BARRELS

Referring to the article on stainless steel beer barrels in the Aug. 4 Newsfront. We can confirm your statement that they have caught on. We thought you would like to know that we have been manufacturing stainless steel beer barrels, commercially, since 1935.

J. E. MARTIN
President
Firestone Steel Products Co.
Akron, Ohio

We appreciate your bringing this error to our attention.—Ed.

METAL LATH

We have a request from one of our customers on a machine suitable for the manufacturing of expanded metal lath which is used in plastering. We would appreciate your advising us of the name and address of a firm manufacturing suitable equipment.

E. L. ARMSTRONG
A. R. Williams Machinery Co., Ltd.
Ottawa, Canada

Since the production of expanded metal lath is largely a press operation, we suggest that you contact some of the large press manufacturers.—Ed.

MILLING AIRCRAFT PARTS

Our engineers have been very much impressed with some provocative studies on the subject of production of aircraft parts, published in THE IRON AGE. We would appreciate receiving tear sheets of "Milling Aircraft Wing Skins," from the May 5 issue, and "Taper Milling Aircraft Parts," which appeared in the July 14 issue, both of which will aid us in the further study of the subject.

F. N. PIASECKI
Piasecki Helicopter Corp.
Morton, Pa.

Keeping the Navy "Ship Shape" with the Dempster-Dumpster . .



Shipyards, stations, and the men in Uncle Sam's Navy set a standard of cleanliness that is unsurpassed. Helping to maintain this high standard of Navy cleanliness is the Dempster-Dumpster System of materials handling . . . a system of quick pick-up of preloaded containers for hauling, dumping or moving materials.

Exactly 10 years ago the Navy purchased its first Dempster-Dumpster equipment . . . one truck hoisting unit with several containers. Now there are dozens of hoisting units and thousands of Dempster-Dumpster containers of many types at work keeping Navy yards and stations "ship shape." The sturdy steel foolproof and fireproof containers are placed at various places, such as barracks, mess

halls, the docks and ship yards, wherever materials (solids or liquids) need be deposited immediately as they accumulate. A Dempster-Dumpster truck hoisting unit quickly picks-up each container when it is filled and hauls it to the disposal area. Contents are automatically dumped and container returned.

If you have a materials handling problem demanding more cleanliness, more economy, and more efficiency, it will pay you to investigate the Dempster-Dumpster System—popularly used, not only by the armed forces, but by municipalities, leading industrial plants, and by large and small institutions of all kinds.

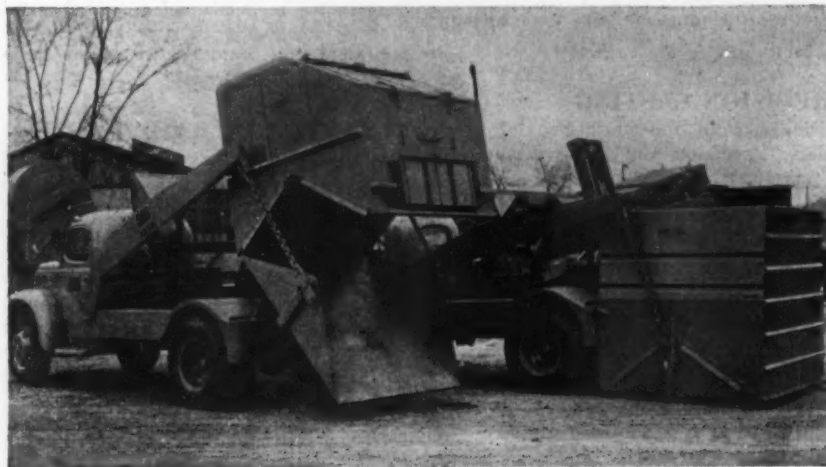


Photo above shows eleven hoisting units recently delivered to the U. S. Navy. Various types of containers are shown in carrying positions. Photo at left shows a hoisting unit preparing to lift a 10 cu. yd. Flat Top container, while another hoisting unit is dumping a 9 cu. yd. Trash and Rubbish Kolektor type container. All controls of unit are conveniently located at the driver's seat. One driver and one truck handles any number of containers regardless of types.

**DEMPSTER
BROTHERS
INC.**

399 DEMPSTER BLDG.
KNOXVILLE 17, TENNESSEE

Briefs and Bulletins

devaluation—Despite the loud cries of economists and politicians for many months that Britain must eventually devalue her currency, the move caught most people flat-footed. Net result of the move will be to make the prices of British products more attractive on foreign markets. A British auto which formerly sold for \$1200 plus taxes will now sell for about \$950 plus taxes. THE IRON AGE was warned by cable from its correspondent in London that devaluation raises doubts regarding steel and other reconstruction plans in view of British reliance on U. S. imports and the Chancellor's hint of a capital development slowdown.

hourly earnings up—Despite the drop in steel production during July, average hourly earnings of workers rose to \$1.699 from \$1.684 in June, according to American Iron & Steel Institute. During the first 7 months of 1949 the industry's payroll, estimated at \$1,321,373,000, was 7 pct larger than during the same period a year ago; estimated total employment was 639,000, or 10,000 larger than in the corresponding period of 1948.

not justified—Full page ads in bold type saying "A steel strike is not justified" appeared in newspapers across the nation on Monday. It was signed by U. S. Steel Corp., and was published by newspapers serving 45 million readers. The ad outlined the corporation's position in the labor crisis. It closed by saying, "If a strike occurs, the Union must assume the responsibility."

prospects bright—The outlook for locating a steel mill in New England is extremely bright, Frederick S. Blackall, Jr., chairman of the New England Council iron and steel supply committee, told the final session of the council's quarterly meeting. He said a source of steel in New England would cause expansion of metal working plants already located there.

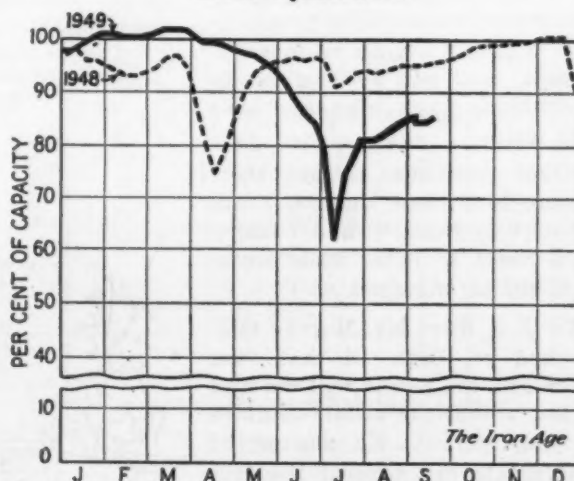
available—Facilities of the Imperial Works plant of Oil Well Supply Co., Oil City, Pa., are being made available to commercial producers for the manufacture of a wide range of products. John B. Pearson will handle the new business as head of a specialty sales department, which will supplement the company's present sales organization now serving the petroleum industry.

deferred payment—A deferred payment plan is available for all types of Bliss presses. Under the plan buyers can defer payments over a period from 1 to 3 years by making a 25 pct down payment. Interest is charged at 6 pct on the balance. Average interest costs for a year amount to 3.25 pct on the original deferred sum. There are no financing charges. American Wheelabrator & Equipment Corp., Mishawaka, has a similar plan (THE IRON AGE, Sept. 15, p. 126).

august increase—After four consecutive months of decline, steel output increased in August, but was still 12 pct below the average monthly output of the first half of 1949 and 10 pct below August of 1948, according to the American Iron & Steel Institute. August output of ingots and steel for castings totaled 6,710,820 tons.

pittsburgh business off—Business in the Pittsburgh district has receded for 3 consecutive weeks, according to the Bureau of Business Research of the University of Pittsburgh. Lower industrial operations caused the index to fall from 156.3 pct of the 1935-39 average to 154.7 last week.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
Sept. 11	84.5*	93.5*	84.0	85.0	100.0*	101.0	102.5	101.0	96.0*	81.5	79.0	89.5	91.5	86.0*
Sept. 18	85.5	94.0	85.0	85.0	97.0	101.0	104.0	101.0	98.0	85.0	84.0	90.0	91.5	86.0

* Revised.

Who'll Pay for Pensions

Continued from Page 97

like wire from his erstwhile friend Phil. It read:

Your telegram to me does not constitute a straight-forward and unequivocal reply to the President, to the public, or to the union as to whether your company accepts the board's recommendations as a basis on which to conclude a prompt settlement with the union... I now request that you promptly and plainly advise me whether your companies are likewise willing to accept the recommendations... as a basis on which to conclude a prompt settlement.

To this U. S. Steel's president replied with a wire reminding the union it had been understood the recommendations were not binding on either party, and adding:

In your telegram today you dictate that we shall accept the recommendations of the board before entering into further bargaining... This we are unwilling to do, because it is both unfair and contrary to the assurance given by the President of the United States. We have serious doubt about some of the recommendations... The telegram we received from President Truman on Sept. 10 did not call for an unequivocal reply as to whether we accept the recommendations of the board... If you persist in your unwillingness to engage now in further collective bargaining negotiations, the responsibility is yours, not ours.

Mr. Fairless then explained in a statement that the public should recognize that acceptance of a non-contributory program would set a national pattern and jeopardize many contributory programs now in effect; set a cost increase pattern; and add \$3.00 a ton to steelmaking costs even at 1948's high levels.

Other companies, among them Armco, Bethlehem, Inland, Jones & Laughlin, Republic and Youngstown Sheet & Tube, made somewhat similar statements.

To U. S. Steel Mr. Murray telegraphed on Sept. 14 that "the union and the public will not and do not accept the unfair dictates on your part... No amount of double talk can conceal the fact of this outright refusal..."

That afternoon Mr. Fairless shot the union chief another wire:

Your telegram today is nothing more than a repetition of your dictatorial message of yesterday... We decline to accept your ultimatum... U. S. Steel is willing to join with your union in a study of pensions... to negotiate for an adequate contributory program of social insurance, toward the cost of which U. S. Steel will con-

tribute up to 4¢ an hr as its share... Time is therefore of the essence, and I must ask that you now tell us definitely when your union will meet with us.

After President Truman declared at his Sept. 15 press conference that there was a decided difference between "outright" acceptance of the board report and acceptance as a "basis of negotiation," Federal Mediator Cyrus S. Ching moved into the picture. At his request both sides met in Washington on Monday of this week to attempt a "meeting of the minds" on what Mr. Fairless called a "revolutionary doctrine."

Meanwhile the union began to beat the drums for a strike—to work up rank and file spirit for the walkout that president Murray had last week scheduled for next Saturday midnight.

Resume Your Reading on Page 97

Titanium Metal Discussed

New York—Titanium metal was the subject of a special symposium on Sept. 21 at the annual meeting of the American Chemical Society in Atlantic City. Dr. Roy Dahlstrom, technical director of National Lead Co.'s Titanium Div., presided.



"I'll let you know when Mr. Hawthorne is ready to see you!"

Construction Steel Awards

Fabricated steel awards this week included the following:

- 2600 Tons, Lycoming County, Pa., Pennsylvania Dept. of Highways, George Vang, Pittsburgh, low bidder on general contract.
- 860 Tons, Chicago, Herald American Bldg., to Hansell-Elcock Co., Chicago.
- 570 Tons, Dauphin County, Pa., Pennsylvania Turnpike Section 22 B, to Bethlehem Steel Co., Bethlehem.
- 400 Tons, Seaford, Del., addition to nylon plant for E. I. duPont de Nemours Co., to Bethlehem Fabricators, Inc., Bethlehem.
- 210 Tons, Whiting, Ind., power house for Union Carbide and Carbon Corp., to American Bridge Co., Pittsburgh.
- 175 Tons, Hillsboro, Md., underpass, Maryland State Contract 224-4-215, to Phoenix Bridge Co., Phoenixville, Pa.
- 150 Tons, Springfield, Pa., Holy Cross School, to Morris Wheeler, Philadelphia.

Fabricated steel inquiries this week included the following:

- 325 Tons, King County, Wash., Cedar River bridges on P.S.H. No. 3, Director of Highways, Olympia, bids, to Sept. 23.
- 215 Tons, Okanogan County, Wash., Methow River bridge on P.S.H. No. 16, Director of Highways, Olympia, bids to Sept. 23.

Reinforcing bar awards this week included the following:

- 1050 Tons, Cleveland, Nottingham filtration plant to Paterson Leitch Co., Cleveland.
- 500 Tons, Seattle, Deater Apartments, through J. C. Boespflug, to Northwest Steel Rolling Mills, Inc., Seattle.
- 465 Tons, Chicago, relocation housing site No. 3 through Welsco Construction Co., Chicago, to J. T. Ryerson and Son, Chicago.
- 250 Tons, Boston, new Mystic River bridge, Boston to Chelsea through A. V. Taurash, Inc., Boston, to Bethlehem Steel Co., Bethlehem.
- 220 Tons, Chicago, Weber Paint Co., building to J. T. Ryerson and Son, Inc., Chicago.
- 200 Tons, Minneapolis, Social Service building to Paper-Calmenson Co., St. Paul, Minn.
- 190 Tons, Chicago, building for American Institute of Baking, to J. T. Ryerson and Son, Inc., Chicago.
- 180 Tons, Rochester, Minn., Zumbro River bridge to Paper-Calmenson Co., St. Paul, Minn.
- 170 Tons, La Grange, Ill., pump house for Electro Motive Div. of General Motors Corp., to J. T. Ryerson and Son, Inc., Chicago.
- 100 Tons, Minneapolis, Waite Park School to U. S. Steel Supply Corp., Chicago.
- 100 Tons, Seattle, Art School addition, University of Washington, through Strand & Son, to Northwest Steel Rolling Mills, Inc., Seattle.

Reinforcing bar inquiries this week included the following:

- 500 Tons, Quincy, Ill., Court House and City Hall.
- 400 Tons, Lacrosse, Wis., Holy Cross Seminary.
- 385 Tons, Elyria, Ohio, sewer.
- 360 Tons, Cook County, Ill., highway bridge.
- 275 Tons, Elk River, Minn., generating plant.
- 210 Tons, Aurora, Ill., highway bridge.
- 140 Tons, Chicago, Weber High School.
- 140 Tons, Ravenna, Ohio, Ohio state highway project 687.
- 135 Tons, Ft. Dodge, Iowa, building for Certain-Teed Products Corp., Chicago.

Bearing pile awards this week included the following:

- 110 Tons, Chicago, grade separation at 176th St., through Arcol-Midwest Corp., Chicago.

cago, to Carnegie-Illinois Steel Corp., Pittsburgh.

Steel piling awards this week included the following:

- 405 Tons, Philadelphia, Navy Yard, piers A, B and C, "H" piling plus 60 tons of reinforcing bars, Lang Construction Co., Hampton, Va., low bidder on general contract.
- 410 Tons, Cassville, Wis., power station for Dairyland Power Co., through F. H. McGraw Co., Chicago, to Carnegie-Illinois Steel Corp., Pittsburgh.

Steel piling inquiries this week included the following:

- 105 Tons, Canterbury and Plainfield, Conn., twin span reinforced concrete slab bridge.

Pickworth Visiting Steel Plants

New York — Fred Pickworth, managing director, English Steel Corp., Ltd., Vickers Works, Sheffield, England, arrived here last week for a 6 weeks' tour of Canadian and U. S. steel plants. Mr. Pickworth's itinerary will include Montreal and Vancouver in Canada. The purpose of the Canadian visit will be to develop additional business there.

The American trip will include stops at San Francisco and Los Angeles on the West Coast, Chicago, Pittsburgh, Buffalo, and Niagara Falls, N. Y. The purpose of the American tour will be to gain additional information and attempt to market some specialties that may be of use in industry. During Mr. Pickworth's stay he will be the guest of A. Milne & Co., and can be contacted through any one of their offices.

Kennecott Promotes Officials

New York — Kennecott Copper Corp. has announced that Carl T. Ulrich, vice-president and treasurer, will serve as chief executive officer of the corporation until a new president is chosen to succeed the late E. T. Stannard. Mr. Ulrich is also president of the Kennecott Sales Corp., and vice-president and treasurer of Braden Copper Co. It is understood that Mr. Ulrich had planned to retire early in 1950.

J. C. Kinnear, vice-president, has been elected a director of the corporation. Anton Gray, chief geologist, has been elected vice-president.

Near Collapse of Welfare Fund Forces Hand of John L. Lewis

Strike is expected to have little immediate effect on steel talks.

Pittsburgh—Near-collapse of his welfare fund finally has forced the hand of John L. Lewis in his latest set-to with the coal mine operators, and miners refused Monday to return to the pits, thus extending their 3-day-a-week "stabilization" strike into a full-fledged walkout.

Although no official strike call came from United Mine Workers' headquarters, miners in the rich fields of Pennsylvania, West Virginia, Ohio and other states nevertheless stayed away from their jobs. Approximately 450,000 were idle.

Most Mills Have Fair Stocks

The all-out strike signal was Mr. Lewis' suspension of welfare fund payments, effective last Saturday, following an emergency meeting of the fund's trustees.

The strike is likely to have little effect on steel-labor conciliation efforts. Observers point out that the prospect of a steel shutdown for lack of coal is still some time off. Although Mr. Lewis' 2-month "stabilization" strike had depleted coal stocks, most mills reportedly have at least a 45-day supply above

ground. If there is to be a steel strike, it likely would come well before these stocks are exhausted.

Mr. Lewis adroitly shifted blame for his action on coal producers who have refused to make their 20¢ a ton payments to the fund in the absence of a contract to replace the agreement that expired June 30.

But a question in the minds of some operators is whether the fund would not have collapsed anyway, even had all operators continued their payments. Mr. Lewis is expected to demand that operators increase their per-ton royalty contributions to 40¢ if they want a new contract. Exact financial condition of the fund is not known here, but reports are that benefit disbursements have been running about \$3 million ahead of receipts, and that reserves are near the bottom of the barrel.

Rule on Contract Renegotiation

Washington—Grounds for the exemption of military contracts or subcontracts by general classes or types from renegotiation are outlined in an amendment to Part 423 of the Military Renegotiation Regulation, issued by the Military Renegotiation Policy and Review Board, Dept. of Defense.

In general, exemptions will be made only when the economic conditions in the industry concerned, the volume of business, or other conditions, give reasonable assurance that excessive profits will not be realized from the contracts or subcontracts.

Shipyard Rebuilds Cutter

Los Angeles—Despite cuts in personnel because of Navy economies, the Naval shipyard here has completed the rebuilding of the U.S.S. Redbud, a former Coast Guard ship, for special transport and supply service in Greenland.

Although not an ice breaker, the Redbud is designed with a special bow which will facilitate its maneuvers through ice fields.



Nonferrous METALS OUTLOOK

Market Activities



by

John Anthony

British will announce new metal prices Sept. 22 . . .

Aluminum producers may lose their export market . . .

Slight reduction expected in the dollar price of tin.

New York — Although devaluation of sterling had long been expected in metal circles, the 30 pct cut came as a sharp surprise to many in the industry who had expected much less drastic devaluation. Speculation is rife in metal circles as to the effect of the cut on British metal prices.

It is apparent that the British Ministry of Supply is not going to step up all its metals prices in terms of sterling by 30 pct thereby returning them to the former dollar equivalent. Information in the trade indicates that the new sterling prices will not be announced until Sept. 22.

One principal purpose of the pound devaluation was to permit UK exports to compete in the world's markets. There is a good probability that British prices for some metals may be set low enough in terms of sterling to capture markets now being served by the United States or other exporting nations.

UK Aluminum May Come Here

Aluminum producers, for example, are now speculating on the possibility of the loss of some or all of their present small export markets. And in addition there is some possibility of British exports of semifinished forms of aluminum

NONFERROUS METALS PRICES

	Sept. 14	Sept. 15	Sept. 16	Sept. 17	Sept. 19	Sept. 20
Copper, electro, Conn. . . .	17.025	17.025	17.025	17.025	17.025	17.025
Copper, Lake, Conn.	17.75	17.75	17.75	17.75	17.75	17.75
Tin, Grade A, New York . . .	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	10.00	10.00	10.00	10.00	10.00	10.00
Lead, St. Louis	14.925-14.975	14.925-14.975	14.925-14.975	14.925-14.975	14.925-14.975	14.925-14.975

Note: Quotations are going prices.

—sheets, plates, extrusions, etc.—into the domestic market in competition with domestic production. It is understood that the UK aluminum industry is now competing abroad in semifinished products with the domestic producers. If prices are set low enough, many markets could be controlled.

Expect Tin Reduction

Domestic market factors are speculating, in the case of tin, that there will be a slight reduction in the dollar price of tin when the market is reopened. This action is expected because of the changeover of the tin market in the last few months to a buyers' market. Also a great deal of resistance has been set up by domestic buyers recently to the continuation of the \$1.03 market price.

Except for the Netherlands tin producers, British Malayan tin pro-

ducers have no large scale competition. Therefore there would be no real advantage in a major reduction in the dollar price of tin, which would also reduce the British dollar intake.

There is some precedent for this expectation. In 1931 when market conditions were somewhat similar, the UK reduced the value of the pound from \$4.86 to \$3.86. At that time the price of tin was advanced to the extent that there was a net reduction of about 2½¢ per lb in U. S. currency.

Sales of domestic and Chilean copper to foreign markets by U. S. producers at present levels could well be limited by the general devaluation of currencies. Seaboard refineries were set up in present locations primarily to handle foreign as well as domestic concentrates and to service all markets.

Nonferrous Prices

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	38.50
Beryllium copper, 3.75-4.25% Be	
dollars per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$52.00
Bismuth, ton lots	\$2.00
Cadmium, del'd	\$2.00
Cobalt, 91-99% (per lb)	\$1.80 to \$1.87
Copper, electro, Conn. Valley	17.625
Copper, lake, Conn. Valley	17.75
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$100 to \$110
Lead, St. Louis	14.925-14.975
Lead, New York	15.125
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	24.50
Mercury, dollars per 76-lb flask	
f.o.b. New York	\$72 to \$75
Nickel, electro, f.o.b. New York	42.93
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$69 to \$72
Silver, New York, cents per oz.	73.25
Tin, Grade A, New York	91.03
Zinc, East St. Louis	10.00
Zinc, New York	10.72
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

Remelted Metals

Brass Ingot

(Published prices, cents per lb delivered, carloads)

85-5-5-5 ingot		
No. 115	15.00*	16.50
No. 120	14.50*	16.00
No. 123	14.00*	15.50
80-10-10 ingot		
No. 305		21.00
No. 315		18.00
88-10-2 ingot		
No. 210		27.50
No. 215		24.50
No. 245	17.50*	19.75
Yellow ingot		
No. 405	12.75*	14.25
Manganese bronze		
No. 421		19.00

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.75-19.00
0.60 copper, max.	18.50-18.75
Piston alloys (No. 122 type)	16.75
No. 12 alum. (No. 2 grade)	15.50-16.00
108 alloy	16.25-16.75
195 alloy	17.25-17.50
13 alloy	18.50-18.75
AXS-679	16.50-16.75
5% Ti, Aluminum, f.o.b., Eddystone, Pa.	
Low copper	31.00
2% copper	28.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 1/2%	17.50-18.00
Grade 2—92-95%	16.50-17.00
Grade 3—90-92%	15.50-16.00
Grade 4—85-90%	14.50-15.00

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	34%
Electrodeposited	32%
Rolled, oval, straight, delivered	31.46
Ball anodes	32%
Brass, 80-20	
Cast, oval, 15 in. or longer	30%
Zinc, oval, 99.886, f.o.b. Detroit	17 1/2
Ball anodes	16 1/4
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	32.15
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	45.00
Copper sulfate, 99.5 crystals, bbl.	11.10
Nickel salts, single or double, 4-100 lb bags, frt allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz lots, per oz.	59
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc sulfate, crystals, 22.5 pct, bags	6.75
Zinc sulfate, 25 pct, flakes, bbl.	7.75

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 76S-O, 76S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 76S-O, 76S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 76S-O, 76S-OAL, 47.6¢.	
Plate: 1/4 in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 76S-F, 76S-FAL, 33.9¢.	
Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.5¢ to 76¢; 23 to 25, 36.7¢ to \$1.05; 35 to 37, 44¢ to \$1.53; 47 to 49, 63.5¢ to \$2.20.	
Red, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3.5 in., 2S, 3S, 36.5¢ to 32¢.	
Screw Machine Stock: Drawn, 1/4 to 1 1/8 in., 11S-T3, R317-T4, 49¢ to 38¢; cold-finished, 1/4 to 1 1/4 in., 11S-T3, 37.5¢ to 35.5¢; 1/2 to 2 in., R317-T4, 37.5¢ to 34.5¢; rolled, 1 1/16 to 3 in., 11S-T3, 35.5¢ to 32.5¢; 2 1/4 to 3 1/2 in., R317-T4, 33.5¢ to 32.5¢. Base 5000 lb.	
Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 34¢ to 26.5¢; 52S, 44¢ to 32¢; 61S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 76S-T6, 76¢ to 55¢.	

Magnesium

(Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb)

Sheets and Plate: M, FSA, 1/4 in., 54¢-56¢; 0.188 in., 54¢-58¢; B & S page 8, 55¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-1.01; 22, \$1.22-\$1.31; 24, \$1.62-\$1.75. Specification grade higher.	
Extruded Round Rod: M, diam in., 1/4 to 0.311, 58¢; 1/2 to 3/4, 46¢; 1 1/4 to 1.749, 43¢; 2 1/4 to 5, 41¢. Other alloys higher.	
Extruded Square Hex. Bar: M, size across flats, in., 1/4 to 0.311, 61¢; 1/2 to 0.749, 49¢; 1 1/4 to 1.749, 44¢; 2 1/4 to 4, 42¢. Other alloys higher.	
Extruded Solid Shapes: Rectangle: M, in weight per ft for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.3 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.	
Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, 1/4 to 5/16, \$1.14; 5/16 to 3/8, \$1.02; 3/8 to 1/2, 76¢; 1/2 to 2 in., 65¢; 0.065 to 0.082, 3/4 to 7/16, 85¢; 3/4 to 1, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, 1/2 to 3/4, 84.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.	

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold rolled	60	47
Strip, cold-rolled	56	50
Rods and bars	55	45
Angles, hot-rolled	56	45
Plates	53	46
Seamless tubes	59	50
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Sheets	Rods	Shapes
Copper	31.30		30.90
Copper, hot-rolled		27.15	
Copper, drawn	28.40		
Low brass	29.47	29.16	32.38*
Yellow brass	28.19	27.88	31.20*
Red brass	29.89	29.58	32.80*
Naval brass	33.13	27.19	28.44
Leaded brass		22.76	26.85
Commercial bronze	30.84	30.53	33.50*
Manganese bronze	36.63	30.54	32.04
Phosphor bronze	50.47	50.72	
Muntz metal	31.15	26.71	27.96
Everdur, Hercu-loy, Olym-ple, etc	36.19	35.14	
Nickel silver, 10 pct	39.12	41.41	41.44
Architectural bronze			26.85

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1/4¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turn-ings
Copper	14%	13%
Yellow brass	12	11
Red brass	13 1/4	12 1/4
Commercial bronze	13 1/4	12 1/4
Manganese bronze	11 1/4	10%
Leaded brass rod ends	11%	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	14.50-14.75
No. 2 copper wire	13.50-13.75
Light copper	12.50-12.75
Refinery brass	12.50*
Radiators	9.25

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	14.25
No. 2 copper wire	13.25
Light copper	12.25
No. 1 composition	11.25
No. 1 comp. turnings	10.75
Rolled brass	9.50
Brass pipe	10.25
Radiators	9.25-9.50
Heavy yellow brass	8.50-8.75

Aluminum

Mixed old cast	10.50-11.00
Mixed old clips	10.50-11.00
Mixed turnings, dry	8.00
Pots and pans	10.50-11.00
Low copper	11.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	13-13 1/4
No. 2 heavy copper and wire	12-12 1/4
Light copper	11-11 1/4
Auto radiators (unswaged)	8-8 1/4
No. 1 composition	9 1/4-9 1/2
No. 1 composition turnings	8 1/2-9
Clean red car boxes	8-8 1/4
Cocks and faucets	8-8 1/4
Mixed heavy yellow brass	6 1/2-7
Old rolled brass	8-8 1/4
Brass pipe	8 1/4-8 1/2
New soft brass clippings	10-10 1/4
Brass rod ends	7 1/2-8
No. 1 brass rod turnings	7 1/2-7 3/4

Aluminum

Alum. pistons and struts	5-5 1/2
Aluminum crankcases	7-8
2S aluminum clippings	10 1/2-11
Old sheet and utensils	7-8
Borings and turnings	7-8
Misc. cast aluminum	7-8
Dural clips (24S)	7-8

Zinc

New zinc clippings	6-6 1/2
Old zinc	4-4 1/2
Zinc routings	2 1/2-3 1/4
Old die cast scrap	3-3 1/4

Nickel and Monel

Pure nickel clippings	16-17
Clean nickel turnings	14-15
Nickel anodes	16-17
Nickel rod ends	16-17
New Monel clippings	10 1/4-11 1/4
Clean Monel turnings	6-7
Old sheet Monel	7-8
Old Monel castings	7-8
Inconel clippings	10-11
Nickel silver clippings, mixed	6-7
Nickel silver turnings, mixed	5 1/4-6

Lead

Soft scrap, lead	11 1/4-11 3/4
Battery plates (dry)	5 1/4-6

Magnesium

Segregated solids	9-10
Castings	8 1/2-9 1/4

Miscellaneous

Block tin	73-75
No. 1 pewter	47-49
No. 1 auto babbitt	40-42
Mixed common babbitt	11 1/2-12
Solder joints	10 1/2-11
Siphon tops	45-47
Small foundry type	12-13 1/4
Monotype	12-12 1/2
Lino. and stereotype	11 1/2-12
Electrotype	10 1/4-11
New type shell cuttings	10 1/4-10 1/2
Hand picked type shells	4
Lino. and stereo. dross	5 1/4-5 1/2
Electro. dross	4 1/4-4 1/2

MARKETS—PRICES—TRENDS



SCRAP

Iron & Steel

Prices Up With Some Large-Scale Buying

Prices are up again this week with indications that some mills are beginning to do some large-scale buying. Dealers are not too eager to part with their scrap and are still holding out for higher prices. There were reports of many transactions where the brokers were bypassing the dealers to fill orders at higher prices than they were willing to offer the dealers. The possibility of a steel strike still hangs over the scrap market and some observers do not expect any real activity until this threat is removed. The top quotation of No. 1 steel was up \$3.50 in Youngstown; in Chicago, Cleveland, and Birmingham it was up \$3.00; in Pittsburgh it was up \$1.50; in Buffalo and Cincinnati it was up \$1.00; and in New York it was up 50¢. THE IRON AGE scrap composite is up \$1.67 per gross ton to \$27.42.

PITTSBURGH — There was some thought among the trade that perhaps the market will level off at around the \$30.00 top now quoted for No. 1 heavy melting, up \$1.50 from last week. The thinking is that at \$30.00 scrap has now risen from the OPA price of \$20.00 in approximate proportion with price rises of finished steel products. Some observers were not so sure, however. This week's price is

based on a buy of substantial proportions by a Pittsburgh district mill. Machine shop turnings were up 50¢ to a top of \$19.50, and low phos rose to \$32.00.

CHICAGO—Brokers are bypassing dealers to fill the small orders they have. They are going direct to factories to fill their orders and are paying higher prices than they offer the dealer. Dealer scrap will only come back again when the mill orders become large enough so that the broker can't possibly cover with his factory scrap. This week's prices are representative of such orders and cover the only scrap moving at this time. In cases direct customer to mill arrangements have brought even higher prices. The boatloads of scrap which have arrived recently at local mills have cost close to \$30.00 per gross ton delivered. In cases a \$2.00 differential exists between yard turnings and borings and industrial scrap. Dealers as yet cannot obtain the high dollar at which most scrap at the moment is moving.

PHILADELPHIA—Brokers were paying higher prices to cover outstanding orders for steel grades, but no new business at higher prices has been placed by mills. Pipe foundries were back in the market, paying \$38.00 for yard cast. Other foundries were also buying, at higher cast prices. Rail specialties were sold at higher prices.

NEW YORK—Demand continues strong in this market with more consumers in the market for scrap. The steel picture remains about the same with prices somewhat higher for this week. No. 1 heavy melting is being quoted at \$18.50 to \$19.00 on an appraisal of all market factors. Cast grades are still in demand

since the foundries have been unable to accumulate inventories. Recently many foundries have been having their material trucked instead of using rail shipment. There has been a good demand for clean cast chemical borings and the item is up another \$1.00 for the week.

DETROIT—The local scrap market is marking time pending settlement of the calling of a steel strike but the undertones of the market remain strong and active. As has been the case for some time, no open mill buying has been reported. Surveys indicate that many dealers are tending to hang on to No. 1 bundles in the face of continued mill resistance to present prices. Cast grades are also strong, although speculative interest in this market apparently does not match the long interest in steel grades.

CLEVELAND—A major consumer in the Valley bought a tonnage of No. 1 heavy melting steel late last week at \$32.00, temporarily firming up a market that has been supported primarily by broker buying for the past 2 weeks. The walkout in the coal mines will not affect operations here or in the Valley for an estimated 2 or 3 weeks. However, the possibility of a steel strike has the scrap market in a state of suspension, as some brokers are very long. A steel strike would mean a price break, but at press time no hold-ups on shipments had been reported.

BOSTON—The situation here remains the same, with activity far below par. The gains recently made in scrap and cast are being held for the most part, but dealers are still wondering if there is any basis for the rise.

BUFFALO—Price advances in the scrap market were extended \$1.00 to \$3.50 as a 6-week stalemate in steelmaking items ended with sales of approximately 12,000 tons to a leading mill consumer. Actually, prices were \$8.00 higher than those paid on the last tonnage sale. Heavy melting, bundles and turnings were included in the sales. Turnings showed the biggest gain. Dealers did not view the sale with surprise despite the unsettled labor situation in the industry. The local market had been moving up on sales made by local consumers with outside sellers.

CINCINNATI—Despite the steel strike threat, all grades of scrap except turnings were in active demand at press time. Coal stocks are reported good. Broker buying is a big factor in the strength of this market with material moving within the district as well as to remote consumers. Foundries are buying some tonnages but not enough to prevent some of the foundry grades from moving out.

BIRMINGHAM—No. 1 heavy melting steel has advanced \$3.00 in this market but dealers are not too eager to sell at the increased price. With most of the material being purchased by mills in other districts, railroads in the Birmingham area have been selling considerable tonnages of railroad scrap. No. 1 railroad heavy melting has shot up to as high as \$28.50 from \$23.00 but other districts are reported offering more.

ST. LOUIS—It is still a brokers' market as far as the St. Louis industrial district is concerned. While the mills have made no new purchases, brokers continue to pay high prices for material to cover short sales and in speculation. This is true also of foundry grades, which went further up in price this week.

UNIT 1020A

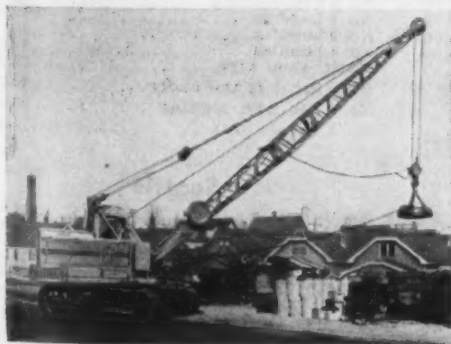
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UNIT 1020A . . . Perfectly balanced . . . All-around stability . . . Handles a 45 inch magnet with ease.



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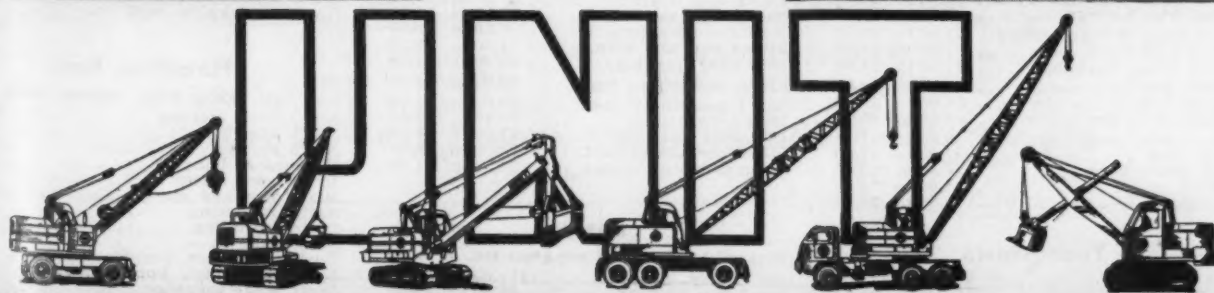


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Quickly convertible to hook, clamshell or magnet, the UNIT 1020A can handle every scrap yard job.

The UNIT 1020A handles heavy steel, baled or loose scrap with day-in and day-out dependability.



SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHES • MAGNETS

A 5437-1P-C

Pittsburgh

No. 1 hvy. melting	\$29.50 to \$30.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 bundles	29.50 to 30.00
No. 2 bundles	22.50 to 23.00
Machine shop turn.	19.00 to 19.50
Mixed bor. and ms. turn.	19.00 to 19.50
Shoveling turnings	21.00 to 22.00
Cast iron borings	20.00 to 21.00
Low phos. plate	31.50 to 32.00
Heavy turnings	24.00 to 25.00
No. 1 RR. hvy. melting	31.50 to 32.00
Scrap rails, random lgth.	24.00 to 35.00
Rails 2 ft and under	38.00 to 39.00
RR. steel wheels	33.00 to 34.00
RR. spring steel	33.00 to 34.00
RR. couplers and knuckles	33.00 to 34.00
No. 1 machinery cast	39.00 to 40.00
Mixed yard cast	35.00 to 36.00
Heavy breakable cast	29.00 to 30.00
Malleable	32.00 to 33.00

Chicago

No. 1 hvy. melting	\$28.00 to \$29.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 factory bundles	28.00 to 29.00
No. 1 dealers' bundles	24.00 to 25.00
No. 2 dealers' bundles	22.00 to 23.00
Machine shop turn.	18.00 to 20.00
Mixed bor. and turn.	17.00 to 19.00
Shoveling turnings	19.00 to 21.00
Cast iron borings	18.00 to 20.00
Low phos. forge crops	33.00 to 34.00
Low phos. plate	31.00 to 32.00
No. 1 RR. hvy. melting	29.00 to 30.00
Scrap rails, random lgth.	35.50 to 36.50
Rerolling rails	41.00 to 42.00
Rails 2 ft and under	40.00 to 41.00
Locomotive tires, cut	37.00 to 38.00
Cut bolsters & side frames	35.00 to 36.00
Angles and splice bars	35.00 to 36.00
RR. steel car axles	43.00 to 44.00
No. 3 steel wheels	31.00 to 32.00
RR. couplers and knuckles	35.00 to 36.00
No. 1 machinery cast	42.00 to 43.00
No. 1 agricul. cast	41.00 to 42.00
Heavy breakable cast	33.00 to 34.00
RR. grate bars	31.00 to 32.00
Cast iron brake shoes	31.00 to 32.00
Cast iron car wheels	35.00 to 36.00
Malleable	37.00 to 39.00

Philadelphia

No. 1 hvy. melting	\$24.00
No. 2 hvy. melting	22.50
No. 1 bundles	24.00
No. 2 bundles	21.50
Machine shop turn.	\$16.00 to 16.50
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Low phos. punchings, plate	26.50 to 27.00
Low phos. 5 ft and under	25.50 to 26.00
Low phos. bundles	25.50 to 26.00
Hvy. axle forge turn.	24.00
Clean cast chem. borings	20.50 to 21.50
RR. steel wheels	27.00 to 29.00
RR. spring steel	27.00 to 29.00
No. 1 machinery cast	38.00 to 40.00
Mixed yard cast	36.00 to 38.00
Heavy breakable cast	33.00 to 34.00
Cast iron carwheels	34.00 to 35.00
Malleable	34.00 to 35.00

Cleveland

No. 1 hvy. melting	\$27.50 to \$28.00
No. 2 hvy. melting	25.00 to 25.50
No. 1 bushelings	27.50 to 28.00
No. 1 bundles	27.50 to 28.00
No. 2 bundles	19.50 to 20.00
Machine shop turn.	16.50 to 17.00
Mixed bor. and turn.	19.50 to 20.00
Shoveling turnings	19.50 to 20.00
Cast iron borings	19.50 to 20.00
Low phos. 2 ft and under	29.00 to 29.50
Steel axle turn.	27.50 to 28.00
Drop forge flashings	27.50 to 28.00
No. 1 RR. hvy. melting	32.00 to 33.00
Rails 3 ft and under	38.00 to 39.00
Rails 18 in. and under	39.00 to 40.00
No. 1 machinery cast	40.00 to 41.00
RR. cast	41.00 to 42.00
RR. grate bars	31.00 to 32.00
Stove plate	34.00 to 35.00
Malleable	35.00 to 36.00

Youngstown

No. 1 hvy. melting	\$31.50 to \$32.00
No. 2 hvy. melting	29.00 to 29.50
No. 1 bundles	31.50 to 32.00

Scrap IRON & STEEL Prices

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

No. 2 bundles	\$22.00 to \$22.50
Machine shop turn.	19.00 to 19.50
Shoveling turnings	22.00 to 22.50
Cast iron borings	22.00 to 22.50
Low phos. plate	32.00 to 32.50

Buffalo

No. 1 hvy. melting	\$27.50 to \$28.00
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	25.50 to 26.00
No. 1 bundles	27.00 to 27.50
No. 2 bundles	24.00 to 24.50
Machine shop turn.	19.50 to 20.00
Mixed bor. and turn.	19.50 to 20.00
Shoveling turnings	21.50 to 22.00
Cast iron borings	19.50 to 20.00
Low phos. plate	28.50 to 29.00
Scrap rails, random lgth.	27.00 to 28.00
Rails 18 in. and under	32.00 to 33.00
RR. steel wheels	28.00 to 29.00
RR. spring steel	28.00 to 29.00
RR. couplers and knuckles	28.00 to 29.00
No. 1 cupola cast	36.00 to 37.00
Mixed yard cast	34.00 to 35.00
Stove plate	34.00 to 35.00
Small indus. malleable	22.50 to 23.50

Birmingham

No. 1 hvy. melting	\$25.00
No. 2 hvy. melting	24.00
No. 2 bundles	22.00
No. 1 busheling	24.00
Machine shop turn.	\$16.00 to 17.00
Shoveling turnings	19.00
Cast iron borings	18.00
Bar crops and plate	29.00 to 30.00
Structural and plate	29.00 to 30.00
No. 1 RR. hvy. melt.	28.00 to 28.50
Scrap rails, random lgth.	29.00 to 30.00
Rerolling rails	33.00 to 34.00
Rails 2 ft and under	34.00 to 35.00
Angles & splice bars	32.00 to 33.00
Std. steel axles	28.00 to 29.00
No. 1 cupola cast	33.50 to 34.00
Stove plate	28.00
Cast iron carwheels	23.00 to 24.00

St. Louis

No. 1 hvy. melting	\$24.00 to \$25.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 bundled sheets	21.00 to 22.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Rails, random lengths	30.00 to 31.00
Rails 3 ft and under	33.00 to 34.00
Locomotive tires, uncut	25.00 to 26.00
Angles and splice bars	33.00 to 34.00
Std. steel car axles	36.00 to 37.00
RR. spring steel	29.00 to 30.00
No. 1 machinery cast	36.00 to 38.00
Hvy. breakable cast	29.00 to 30.00
Cast iron brake shoes	31.00 to 32.00
Stove plate	31.00 to 32.00
Cast iron car wheels	34.00 to 35.00
Malleable	30.00 to 32.00

New York

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$18.50 to \$19.00
No. 2 hvy. melting	17.00 to 18.00
No. 2 bundles	15.00 to 15.50
Machine shop turn.	9.50 to 10.00
Mixed bor. and turn.	8.50 to 9.50
Shoveling turnings	10.00 to 11.00
Clean cast chem. bor.	16.00 to 16.50
No. 1 machinery cast	30.00 to 32.00
Mixed yard cast	29.00 to 30.00
Charging box cast	23.00 to 25.00
Heavy breakable cast	23.00 to 25.00
Unstrp. motor blocks	23.00 to 24.00

Boston

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$17.00 to 18.00
No. 2 hvy. melting	15.00 to 16.00
No. 1 bundles	17.00 to 18.00

No. 2 bundles	\$15.00 to \$15.50
Machine shop turn.	9.00 to 10.00
Mixed bor. and turn.	8.50 to 9.00
Shoveling turnings	9.00 to 9.50
No. 2 busheling	10.00 to 11.00
Clean cast chem. borings	11.50 to 12.50
No. 1 machinery cast	31.00 to 33.00
No. 2 machinery cast	26.00 to 28.00
Heavy breakable cast	18.50 to 19.00
Stove plate	20.50 to 21.50

Detroit

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$21.00 to \$22.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 bundles	23.00 to 24.00
New busheling	21.00 to 22.00
Flashings	21.00 to 22.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. plate	21.00 to 22.00
No. 1 cupola cast	34.00 to 35.00
Heavy breakable cast	28.00 to 30.00
Stove plate	27.00 to 28.00
Automotive cast	34.00 to 35.00

Cincinnati

Per gross ton, f.o.b. cars:	
No. 1 hvy. melting	\$25.50 to \$26.00
No. 2 hvy. melting	21.50 to 22.00
No. 1 bundles	25.50 to 26.00
No. 2 bundles	19.50 to 20.00
Machine shop turn.	12.50 to 13.00
Mixed bor. and turn.	12.50 to 13.00
Shoveling turnings	15.50 to 16.00
Cast iron borings	14.50 to 15.00
Low phos. 18 in. under	32.50 to 33.00
Rails, random lengths	34.00 to 35.00
Rails, 18 in. and under	42.00 to 43.00
No. 1 cupola cast	38.00 to 39.00
Hvy. breakable cast	33.00 to 34.00
Drop broken cast	42.00 to 43.00

San Francisco

No. 1 hvy. melting	\$17.00
No. 2 hvy. melting	15.00
No. 1 bundles	13.00
No. 2 bundles	13.00
No. 3 bundles	10.00
Machine shop turn	9.00
Elec. fur 1 ft and under	28.00
No. 1 RR. hvy. melting	17.00
Scrap rails, random lgth.	17.00
No. 1 cupola cast	30.00

Los Angeles

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	14.00
No. 3 bundles	12.00
Mach. shop turn.	12.00
Elec. fur 1 ft and under	30.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast	\$32.00 to \$36.00

Seattle

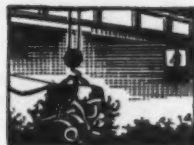
No. 1 hvy. melting	\$16.00
No. 2 hvy. melting	16.00
No. 1 bundles	15.00
No. 2 bundles	15.00
No. 3 bundles	12.00
Elec. fur 1 ft and under	21.00
RR. hvy. melting	19.00
No. 1 cupola cast	\$30.00 to 37.00
Heavy breakable cast	26.00

Hamilton, Ont.

Cast grades f.o.b. shipping point:	
No. 1 hvy. melting	\$20.00
No. 1 bundles	20.00
No. 2 bundles	18.00
Mechanical bundles	18.00
Mixed steel scrap	16.00
Mixed bor. and turn.	20.00
Rails, remelting	22.00
Rails, rerolling	22.00
Bushelings	14.50
Bush., new fact, prep'd	18.00
Bush., new fact, unprep'd	13.00
Short steel turnings	14.00
Cast scrap	\$33.00 to 35.00

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Iron and Steel Scrap...*

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various local quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Sept. 20, 1949	Sept. 13, 1949	Aug. 23, 1949	Sept. 21, 1948
(cents per pound)				
Hot-rolled sheets	3.25	3.25	3.25	3.26
Cold-rolled sheets	4.00	4.00	4.00	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.265
Cold-rolled strip	4.038	4.038	4.038	4.063
Plates	3.40	3.40	3.40	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25

Tin and Terneplate:

(dollars per base box)				
Tinplate (1.50 lb) cokes	\$7.75	\$7.75	\$7.75	\$6.80
Tinplate, electro (0.50 lb)	6.70	6.70	6.70	6.00
Special coated mfg. ternes	6.65	6.65	6.65	5.90

Bars and Shapes:

(cents per pound)				
Merchant bars	3.35	3.35	3.35	3.37
Cold-finished bars	3.995	3.995	3.995	3.995
Alloy bars	3.75	3.75	3.75	3.75
Structural shapes	3.25	3.25	3.25	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.25
Wrought iron bars	9.50	9.50	9.50	9.50

Wire:

(cents per pound)				
Bright wire	4.15	4.15	4.15	4.256

Rails:

(dollars per 100 lb)				
Heavy rails	\$3.20	\$3.20	\$3.20	\$3.20
Light rails	3.55	3.55	3.55	3.55

Semifinished Steel:

(dollars per net ton)				
Rerolling billets	\$52.00	\$52.00	\$52.00	\$52.00
Slabs, rerolling	52.00	52.00	52.00	52.00
Forging billets	61.00	61.00	61.00	61.00
Alloy blooms, billets, slabs	63.00	63.00	63.00	63.00

Wire rod and Skelp:

(cents per pound)				
Wire rods	3.40	3.40	3.40	3.619
Skelp	3.25	3.25	3.25	3.25

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron:	Sept. 20, 1949	Sept. 13, 1949	Aug. 23, 1949	Sept. 21, 1948
(per gross ton)				
No. 2, foundry, Phila.	\$50.42	\$50.42	\$50.56*	\$51.56
No. 2, Valley furnace	46.50	46.50	46.50	43.50
No. 2, Southern Cin'ti.	45.47	45.47	45.47*	49.47
No. 2, Birmingham	39.38	39.38	39.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	43.00
Basic del'd Philadelphia	49.92	49.92	49.74*	50.76
Basic, Valley furnace	46.00	46.00	46.00	43.00
Malleable, Chicago†	46.50	46.50	46.50	43.50
Malleable, Valley	46.50	46.50	46.50	43.50
Charcoal, Chicago	68.56	68.56	73.78	69.55
Ferromanganese†	173.40	173.40	173.40	145.00

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

†Average of U. S. prices quoted on Ferroalloy page.

*Does not include interim increase on total freight charges, effective Jan. 11, 1949.

Scrap:

(per gross ton)				
Heavy melt'g steel, P'gh.	\$29.75	\$28.25	\$23.25	\$42.75
Heavy melt'g steel, Phila.	24.00	23.50	20.00	45.00
Heavy melt'g steel, Ch'go	28.50	25.50	22.50	41.75
No. 1 hy. comp. sh't Det.	23.50	23.50	19.50	38.00
Low phos. Young'n.	32.25	29.75	24.75	47.75
No. 1, cast, Pittsburgh	39.50	39.50	34.50	70.00
No. 1, cast, Philadelphia	39.00	37.00	30.50	65.50
No. 1, cast, Chicago	42.50	42.50	40.50	71.00

Coke: Connellsville:

(per net ton at oven)				
Furnace coke, prompt	\$14.25	\$14.25	\$14.25	\$15.00
Foundry coke, prompt	15.75	15.75	15.75	17.00

Nonferrous Metals:

(cents per pound to large buyers)				
Copper, electro, Conn.	17.625	17.625	17.625	23.50
Copper, Lake Conn.	17.75	17.75	17.75	23.525
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	10.00	10.00	10.00	15.00
Lead, St. Louis	14.925	14.925	14.925	19.30
Aluminum, virgin	17.00	17.00	17.00	16.00
Nickel electrolytic	42.93	42.93	42.93	42.90
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	38.50	38.50	38.50	35.00

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Composite Prices

Finished Steel Base Price	Sept. 20, 1949	One week ago	One month ago	One year ago
	3.705¢ per lb.	3.705¢ per lb.	3.705¢ per lb.	3.720¢ per lb.

	High	Low		
1949....	3.720¢ Jan. 1	3.705¢ May 3		
1948....	3.721¢ July 27	3.193¢ Jan. 1		
1947....	3.193¢ July 29	2.848¢ Jan. 1		
1946....	2.848¢ Dec. 31	2.464¢ Jan. 1		
1945....	2.464¢ May 29	2.396¢ Jan. 1		
1944....	2.396¢	2.396¢		
1943....	2.396¢	2.396¢		
1942....	2.396¢	2.396¢		
1941....	2.396¢	2.396¢		
1940....	2.30467¢ Jan. 2	2.24107¢ Apr. 16		
1939....	2.35367¢ Jan. 3	2.26689¢ May 16		
1938....	2.58414¢ Jan. 4	2.27207¢ Oct. 18		
1937....	2.58414¢ Mar. 9	2.32263¢ Jan. 4		
1936....	2.32263¢ Dec. 28	2.05200¢ Mar. 10		
1935....	2.07642¢ Oct. 1	2.06492¢ Jan. 8		
1934....	2.15367¢ Apr. 24	1.95757¢ Jan. 2		
1933....	1.95578¢ Oct. 3	1.75836¢ May 2		
1932....	1.89196¢ July 5	1.83901¢ Mar. 1		
1931....	1.99626¢ Jan. 13	1.86586¢ Dec. 29		
1929....	2.31773¢ May 28	2.26498¢ Oct. 29		

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Pig Iron	Sept. 20, 1949	One week ago	One month ago	One year ago
	\$45.88 per gross ton	\$45.88 per gross ton	\$45.91 per gross ton	\$44.74 per gross ton

	High	Low		
1949....	\$46.82 Jan. 4	\$45.88 Sept. 6		
1948....	46.91 Oct. 12	39.58 Jan. 6		
1947....	37.98 Dec. 30	30.14 Jan. 7		
1946....	30.14 Dec. 10	25.37 Jan. 1		
1945....	25.37 Oct. 23	23.61 Jan. 2		
1944....	\$23.61	\$23.61		
1943....	23.61	23.61		
1942....	23.61	23.61		
1941....	\$23.61 Mar. 20	\$23.45 Jan. 2		
1940....	23.45 Dec. 23	22.61 Jan. 2		
1939....	22.61 Sept. 19	20.61 Sept. 12		
1938....	23.25 June 21	19.61 July 6		
1937....	23.25 Mar. 9	20.25 Feb. 16		
1936....	19.74 Nov. 24	18.73 Aug. 11		
1935....	18.84 Nov. 5	17.83 May 14		
1934....	17.90 May 1	16.90 Jan. 27		
1933....	16.90 Dec. 5	13.56 Jan. 3		
1932....	14.81 Jan. 5	13.56 Dec. 6		
1931....	15.90 Jan. 6	14.79 Dec. 15		
1929....	18.71 May 14	18.21 Dec. 17		

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel	Sept. 20, 1949	One week ago	One month ago	One year ago
	\$27.42 per gross ton	\$27.42 per gross ton	\$21.92 per gross ton	\$43.16 per gross ton

	High	Low		
1949....	\$43.00 Jan. 1	\$19.33 June 25		
1948....	43.16 July 27	39.75 Mar. 9		
1947....	42.58 Oct. 28	29.50 May 20		
1946....	31.17 Dec. 24	19.17 Jan. 1		
1945....	19.17 Jan. 2	18.92 May 22		
1944....	19.17 Jan. 11	15.76 Oct. 24		
1943....	\$19.17	\$19.17		
1942....	19.17	19.17		
1941....	\$22.00 Jan. 7	\$19.17 Apr. 10		
1940....	21.83 Dec. 30	16.04 Apr. 9		
1939....	22.50 Oct. 3	14.08 May 16		
1938....	15.00 Nov. 22	11.00 June 7		
1937....	21.92 Mar. 30	12.67 June 9		
1936....	17.75 Dec. 21	12.67 June 8		
1935....	13.42 Dec. 10	10.33 Apr. 29		
1934....	13.00 Mar. 13	9.50 Sept. 25		
1933....	12.25 Aug. 8	6.75 Jan. 3		
1932....	8.50 Jan. 12	6.43 July 5		
1931....	11.33 Jan. 6	8.50 Dec. 29		
1929....	17.58 Jan. 29	14.08 Dec. 8		

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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STEEL PRICES

Smaller numbers indicate producing companies. See key on facing page.
Base prices at producing points apply to the sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrow Point	Granite City	Middletown	Warren	Detroit	Johnstown	San Francisco, Los Angeles	Fontana
INGOTS															
Carbon forging	\$50.00 1											\$50.00 31			
Alloy	\$51.00 1.17											\$51.00 31			
BILLETS, BLOOMS, SLABS															
Carbon, re-rolling, net ton	\$52.00 1	\$52.00 1	\$52.00 1		\$52.00 11	\$52.00 2	Conshohocken \$52.00 ²⁶						\$52.00 3		\$71.00 19
Carbon forging billets, net ton	\$61.00 1	\$61.00 1.4	\$61.00 1.8	\$61.00 4	\$61.00 11	\$61.00 3.4	Geneva \$61.00 ¹⁶ Conshohocken \$63.00 ²⁶			\$61.00 ²⁸		\$61.00 31	\$61.00 3		\$80.00 19
Alloy, net ton	\$63.00 1.17	\$63.00 1.4	\$63.00 1			\$63.00 3.4	Bethlehem ³ Canton ^{4,42} Massillon ⁴ = \$63.00			Conshohocken \$75.00 ²⁶		\$63.00 31	\$63.00 3		\$82.00 19
PIPE SKELP	3.25 1.5		3.40 6				3.25 1.4				3.25 ⁴				
WIRE RODS	3.40 2.18	3.40 2.42 ²³		3.40 2	3.40 4.11		3.40 6	3.50 3		Perthamouth 3.40 ²⁰	Warren ⁴ 3.70 ²		3.40 3	4.05 ²⁴ S.F. L.A. 4.20 ²³ L.A.	
SHEETS															
Hot-rolled (18 ga. & hvr.)	3.25 1.5, 9.15	3.25 23	3.25 1.6, 8	3.25 4.11	3.25 4.11	3.25 3	3.25 1.13, 16	3.25 4		Kokomo ³⁰ Warren ⁴ Ashland ⁷ = 3.25		3.45 12		3.95 24 L.A.	4.15 19
Cold-rolled	4.00 ^{1, 5} 7.9, 15, 68		4.00 1.6, 8	4.00 4.6	4.00 11	4.00 3	4.00 6	4.00 3	4.20 7	4.00 7	4.00 ⁴	4.20 12		4.95 24 S.F.	4.90 19
Galvanized (10 gage)	4.40 1.9, 15		4.40 1.8		4.40 4.11		Niles 4.40 ²⁴	4.40 3	Canton 4.40 ⁴	4.40 7	Ashland 4.40 ⁷			5.15 24 S.F., L.A.	
Enameling (12 gage)	4.40 1		4.40 1.8	4.40 4			4.40 6		4.60 22	4.40 7		4.70 12			
Long ternes (10 gage)	4.80 9.15		4.80 1							4.80 7					
Hi Str. Low Alloy, h.r.	4.95 1.5	4.95 1	4.95 1.6, 8	4.95 4.5	4.95 11	4.95 3	4.95 1.4	4.95 3		Conshohocken 4.95 ²⁶	4.95 ⁴	5.15 12			
Hi Str. Low Alloy, c.r.	6.05 1.5		6.05 1.6, 8	6.05 4.5		6.05 3	6.05 6	6.05 3			6.05 ⁴	6.25 12			
Hi Str. Low Alloy, galv.	6.75 1			6.75 4				6.75 3	Canton 6.75 ⁴						
STRIP															
Hot-rolled	3.25 5.7, 9.25	3.25 23.66	3.25 1.6, 8	3.25 5	3.25 11	3.25 3	3.25 1.6, 13	3.25 3	Ashland 3.25 ⁷	3.25 7	3.25 ⁴	3.45 47, 12	Atlanta 3.40 ²⁸	4.00 24	4.40 19
Cold-rolled	4.00 5.7, 9.63	4.15 66	4.00 8	4.00 2.5		4.00 3	4.00 8.19, 40.48	4.00 3	New Haven 4.50 ^{2, 48}		4.00 ^{4, 49} 4.25 ⁴⁹	4.20 12, 47 4.25 ⁴⁸			4.90 19
Hi Str. Low Alloy, h.r.	4.95 5		4.95 1.6, 8	4.95 5	4.95 11	4.95 3	4.95 1.6, 13	4.95 3			4.95 ⁴	5.15 12			
Hi Str. Low Alloy, c.r.	6.05 5			6.05 2.5		6.05 3	6.05 6.13	6.05 3			6.05 ⁴	6.25 12		4.00 ^{24, 42} S.F., L.A. 4.25 ⁴² S.	
TINPLATE*															
Cokes, 1.50 lb. base box	\$7.75 1.5, 9.15		\$7.75 1.6, 8		\$7.85 11			\$7.85 22	\$7.95 22		7.75 ⁴			19.50 24 S.F.	
Deduct \$1.30, \$1.05 and 75¢ respectively from 1.50 lb. coke base box price															
BLACKPLATE, h.e., 29 ga.	5.30 1.5, 15		5.30 1.6, 8					5.40 3	5.50 22		5.30 ⁴				
BARS															
Carbon Steel	3.35 1.5, 17	3.35 1.4, 23	3.35 1.6, 8	3.35 4	3.35 4.11	3.35 3.4	3.35 1.4, 6	3.35 3	Atlanta 3.50 ²⁸	Canton 3.35 ⁴		3.55 12	3.35 3	4.00 ²³ L.A. 4.05 ²⁴ S.F., L.A. 4.10 ²³ S., S.F.	4.00 19
Reinforcing†	3.35 1.5	3.35 4	3.35 1.6, 8	3.35 4	3.35 4.11	3.35 3.4	3.35 1.4, 6	3.35 3	Atlanta 3.50 ²⁸		Canton 3.35 ⁴		3.35 3		4.00 19
Cold-finished	3.95 ³ 4.00 ^{2, 4} 17.52, 69.71	4.00 2.23, 55, 70	4.00 4.73, 74	4.00 2.61		4.00 70	4.00 6.57		Pulnam, Newark = 4.40 ²⁰ Canton = 3.95 ⁷ Massillon, Canton = 4.00 ⁴			4.30 12			
Alloy, hot-rolled	3.75 1.17	3.75 1.4, 23	3.75 1.6, 8			3.75 3.4	3.75 1.6		Bethlehem ³ Canton ^{4, 42} Massillon ⁴ = 3.75		3.75 ²⁰	4.05 12	3.75 3	4.80 62 L.A.	4.75 19
Alloy cold-drawn	4.65 2, 17.52, 69.71	4.65 2.4, 23, 69.70	4.65 4.73, 74	4.65 2.61		4.65 3.70	4.65 6.57		Massillon = 4.65 ⁴ Bethlehem = 4.65 ³		4.65 ²³			Canton = 4.65 ^{4, 42} Newark ²⁰ Worcester ² = 4.95	
Hi Str. Low Alloy, h.r.	5.10 1.5		5.10 1.6, 8	5.10 4	5.10 11	5.10 3	5.10 1.6		Bethlehem = 5.10 ³			5.30 12	5.10 3		
PLATE															
Carbon steel	3.40 1.5	3.40 1	3.40 1.6, 8	3.40 4	3.40 ^{4, 11}	3.40 ³¹	3.40 ¹³		3.40 ³ Costesville = 3.50 ²¹ Claymont = 3.50 ²⁰			3.65 3	3.40 3	4.30 63 S.	4.00 19
Floor plates	4.55 1	4.55 1	4.55 3	4.55 5					Conshohocken ²⁶ Harriburg ²⁵ = 4.55						
Alloy	4.40 1	4.40 1	4.40 1					4.40 3	Costesville = 4.50 ²¹				4.40 3		
Hi Str. Low Alloy	5.20 1.5	5.20 1	5.20 1.8	5.10 4.5	5.20 11	5.20 3	5.20 6	5.20 6	Conshohocken = 5.20 ²⁶ Geneva = 5.20 ¹⁶		5.45 12	5.20 3			
SHAPES, Structural															
Hi Str. Low Alloy	4.95 1.5	4.95 1	4.95 1.6, 8		4.95 11	5.05 3	4.95 6		Bethlehem = 5.05 ³				5.05 3	3.80 ²³ S.F. 3.85 ²³ L.A.	3.80 19
MANUFACTURERS' WIRE															
Bright	4.15 2.5, 18	4.15 ^{4, 23} 2.34		4.15 3.77	4.15 4.11	Portsmouth 4.15 ²⁰	4.15 6	4.25 3		Duluth = 4.15 ² Worcester = 4.45 ³ Pueblo = 4.80 ¹⁴			4.15 3	5.10 ²⁴ S.F.	
PILING, Steel sheet	4.05 1	4.05 1				4.05 1									

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	Chromium Nickel							Straight Chromium		
	301	302	303	304	316	321	347	410	416	430
Ingot, rerolling.....	12.75	13.50	15.00	15.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling.....	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging.....	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	30.00
Bars, wire, structurals.....	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates.....	32.00	32.00	34.80	34.00	50.50	39.50	44.00	26.00	26.50-27.00	26.50
Sheets.....	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled.....	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled.....	30.50	33.00	38.50	38.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key below.

PRODUCING POINTS—Sheets: Midland, Pa., 17; Brackenridge, Pa., 23; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 33, 35; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 49; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 80.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 23; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forging discs, die blocks and rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28.

KEY TO STEEL PRODUCERS

With Home Offices

- 1 Carnegie-Illinois Steel, Corp., Pittsburgh
- 2 American Steel & Wire Co., Cleveland
- 3 Bethlehem Steel Co., Bethlehem
- 4 Republic Steel Corp., Cleveland
- 5 Jones & Laughlin Steel Corp., Pittsburgh
- 6 Youngstown Sheet & Tube Co., Youngstown
- 7 Armco Steel Corp., Middletown, Ohio
- 8 Inland Steel Co., Chicago
- 9 Weirton Steel Co., Weirton, W. Va.
- 10 National Tube Co., Pittsburgh
- 11 Tennessee Coal, Iron & R.R. Co., Birmingham
- 12 Great Lakes Steel Corp., Detroit
- 13 Sharon Steel Corp., Sharon, Pa.
- 14 Colorado Fuel & Iron Corp., Denver
- 15 Wheeling Steel Corp., Wheeling, W. Va.
- 16 Geneva Steel Co., Salt Lake City
- 17 Crucible Steel Co. of America, New York
- 18 Pittsburgh Steel Co., Pittsburgh
- 19 Kaiser Co., Inc., Oakland, Calif.
- 20 Portsmouth Steel Corp., Portsmouth, Ohio
- 21 Lukens Steel Co., Coatesville, Pa.
- 22 Granite City Steel Co., Granite City, Ill.
- 23 Wisconsin Steel Co., South Chicago, Ill.
- 24 Columbia Steel Co., San Francisco
- 25 Copperweld Steel Co., Glassport, Pa.
- 26 Alan Wood Steel Co., Conshohocken, Pa.
- 27 Midvale Co., Philadelphia
- 28 Allegheny Ludlum Steel Corp., Pittsburgh
- 29 Worth Steel Co., Claymont, Del.
- 30 Continental Steel Corp., Kokomo, Ind.
- 31 Rotary Electric Steel Co., Detroit
- 32 Laclede Steel Co., St. Louis
- 33 Northwestern Steel & Wire Co., Sterling, Ill.
- 34 Keystone Steel & Wire Co., Peoria, Ill.
- 35 Central Iron & Steel Co., Harrisburg, Pa.
- 36 Carpenter Steel Co., Reading, Pa.
- 37 Eastern Stainless Steel Corp., Baltimore
- 38 Washington Steel Corp., Washington, Pa.
- 39 Jessop Steel Co., Washington, Pa.
- 40 Blair Strip Steel Co., New Castle, Pa.
- 41 Superior Steel Corp., Carnegie, Pa.
- 42 Timken Steel & Tube Div., Canton, Ohio
- 43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
- 44 American Chain & Cable Co., Inc., New York
- 45 John A. Roebling's Sons Co., Trenton, N. J.
- 46 Simonds Saw & Steel Co., Fitchburg, Mass.
- 47 McLouth Steel Corp., Detroit
- 48 Cold Metal Products Co., Youngstown
- 49 Thomas Steel Co., Warren, Ohio
- 50 Wilson Steel & Wire Co., Chicago
- 51 Sweet's Steel Co., Williamsport, Pa.
- 52 Superior Drawn Steel Co., Monaca, Pa.
- 53 A. M. Byers Co., Pittsburgh
- 54 Fifth Sterling Steel & Carbide Corp., McKeesport, Pa.
- 55 Ingersoll Steel Div., Chicago
- 56 Latrobe Electric Steel Co., Latrobe, Pa.
- 57 Fitzsimons Steel Co., Youngstown
- 58 Stanley Works, New Britain, Conn.
- 59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
- 60 Vanadium-Alloys Steel Co., Latrobe, Pa.
- 61 Cuyahoga Steel & Wire Co., Cleveland
- 62 Bethlehem Pacific Coast Steel Corp., San Francisco
- 63 Follansbee Steel Corp., Pittsburgh
- 64 Niles Rolling Mill Co., Niles, Ohio
- 65 Atlantic Steel Co., Atlanta
- 66 Acme Steel Co., Chicago
- 67 Joslyn Mfg. & Supply Co., Chicago
- 68 Detroit Steel Corp., Detroit
- 69 Wyckoff Steel Co., Pittsburgh
- 70 Bliss & Laughlin, Inc., Harvey, Ill.
- 71 Columbia Steel & Shaffing Co., Pittsburgh
- 72 Cumberland Steel Co., Cumberland, Md.
- 73 La Salle Steel Co., Chicago
- 74 Monarch Steel Co., Inc., Indianapolis
- 75 Empire Steel Co., Mansfield, Ohio
- 76 Mahoning Valley Steel Co., Niles, Ohio
- 77 Oliver Iron & Steel Co., Pittsburgh
- 78 Pittsburgh Screw & Bolt Co., Pittsburgh
- 79 Standard Forgings Corp., Chicago
- 80 Driver Harris Co., Harrison, N. J.

Notes to Steel Price Table:

*Special coated mfg. terms, deduct \$1.10 from 1.50-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct \$2.00 from 1.50-lb coke base box.

†Straight lengths only from producer to fabricator.

PIPE AND TUBING

Base discounts, f.o.b. mills.
Base price, about \$200.00 per net ton.

Standard, Threaded and Coupled

Steel, butt weld*	Black	Galv.
½-in.	43 to 41	26½ to 24½
¾-in.	46 to 44	30½ to 28½
1-in.	48½ to 46½	33½ to 31½
1¼-in.	49 to 47	34 to 32
1½-in.	49½ to 47½	34½ to 32½
2-in.	50 to 48	35 to 33
2½ to 3-in. ..	50½ to 48½	35½ to 33½

Steel, lapweld				
2-in.	39 1/2	26	to 24	
2 1/2 to 3-in. ..	43 1/2 to 42 1/2	28	to 27	
3 1/2 to 6-in. ..	46 1/2 to 42 1/2	31	to 27	

Steel, seamless			
2-in.	38 1/2 to 27	23	to 11 1/2
2 1/2 to 3-in. ..	41 1/2 to 32 1/2	26	to 17
3 1/2 to 6-in. ..	43 1/2 to 35 1/2	28	to 23

Wrought iron, butt weld		Black		Galv.	
1/2-in.	+20 1/2				+47
3/4-in.	+10 1/2				+26
1-in.	+4 1/2				+27
1 & 1 1/4 in. ..	— 1 1/2				+23 1/2
2-in.	— 2				+23
3-in.					

Wrought iron, lap weld		Black		Galv.	
2-in.	+7 1/2				+31
2 1/2 to 3 1/2-in. ..	+5				+26 1/2
4-in.	list				+20 1/2
4 1/2 to 8-in. ..	+2				+22

Extra Strong, Plain Ends

Steel, butt weld			
1/2-in.	42	to 40	27 to 25
3/4-in.	46	to 44	31 to 29
1-in.	48	to 46	34 to 32
1 1/4-in.	48 1/2	to 46 1/2	34 1/2 to 32 1/2
1 1/2-in.	49	to 47	35 to 33
2-in.	49 1/2	to 47 1/2	35 1/2 to 34 1/2
2 1/2 to 3-in. ..	50	to 48	36 to 34

Steel, lapweld			
2-in.	39 1/2 to 38 1/2	25	to 24
2 1/2 to 3-in. ..	44 1/2 to 42 1/2	30	to 28
3 1/2 to 6-in. ..	48 to 44	33 1/2	to 31 1/2

Steel, seamless			
2-in.	37 1/2 to 32 1/2	23	to 18
2 1/2 to 3-in. ..	41 1/2 to 36 1/2	27	to 23
3 1/2 to 6-in. ..	45		30 1/2

Wrought iron, butt weld		Black		Galv.	
1/2-in.	+16				+40
3/4-in.	+9 1/2				+24
1 to 2-in.	— 1 1/2				+23

Wrought iron, lap weld		Black		Galv.	
2-in.	+4 1/2				+27 1/2
2 1/2 to 4-in. ..	— 5				+16
4 1/2 to 6-in. ..	— 1				+20 1/2

For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.

OD Gage		Seamless		Electric Weld	
in in.	BWG	H.R.	C.R.	H.R.	C.D.
2	13	\$19.18	\$22.56	\$18.60	\$21.89
2 1/2	12	25.79	30.33	25.02	29.41
3	12	28.68	33.76	27.82	32.74
3 1/2	11	35.85	42.20	34.78	40.94
4	10	44.61	52.35	43.17	50.78

CAST IRON WATER PIPE

		Per net ton	
6 to 24-in., del'd Chicago		\$95.70	
6 to 24-in., del'd N. Y.		\$92.50 to 97.40	
6 to 24-in., Birmingham		\$2.50	
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less		109.30	
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.			

Numbers after producing points
correspond to steel producers.
See key on previous page.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column Pittsburg, Calif.
Standard & coated nails*	103
Galvanized nails*	103
Woven wire fence†	109
Fence posts, carloads††	112
Single loop bale ties	106
Galvanized barbed wire**	123
Twisted barbed wire	123

* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15 1/2 gage and heavier.
** On 80 rod spools, in carloads. †† Duluth, Joliet and Johnstown.

Base per Pittsburg,
100 lb Calif.

Annealed fence wire†	\$4.80	\$5.75
Annealed, galv. fencing†	5.25	6.20
Cut nails, carloads††	6.75	

† Add 30¢ at Worcester; 10¢ at Sparrows Pt.

†† Less 20¢ to jobbers.

PRODUCING POINTS — Standard, coated or galvanized nails, woven wire fence, bale ties, and barbed wire: Alabama City, Ala., 4; Atlanta, 65; Alliquippa, Pa. (except bale ties), 5; Bartonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburg, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2.

Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.
Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. (21)...	26.50	
Washgtn, Pa. (39)...	26.50	
Claymont, Del. (29)...	26.50	
Conshohocken, Pa. (26)	22.50	
New Castle, Ind. (55)...	26.50	24.00
Nickel-carbon		
10 pct, Coatesville, (26)	27.50	
Inconel-carbon		
10 pct, Coatesville, (21)	36.00	
Monel-carbon		
10 pct, Coatesville, (21)	29.00	
No. 302 Stainless-copper		
stainless, Carnegie, Pa. (41)		75.00
Aluminized steel sheets, Hot dip, Butler, Pa. (7)...		7.75

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

24 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	5.45
Electrical	5.95
Motor	6.70
Dynamo	7.50
Transformer 72	8.05
Transformer 65	8.60
Transformer 58	9.30
Transformer 52	10.10

PRODUCING POINTS—Beech Bottom, W. Va., 18; Brackenridge, Pa., 28; Butler, Pa., 7; Follansbee, W. Va., 63; Granite City, Ill., 22; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Toronto, Ohio, 63; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

Pct Off List

1/2 in. & smaller x 6 in. & shorter...	35
9/16 & 5/8 in. x 6 in. & shorter.....	37
3/4 in. & larger x 6 in. shorter.....	34
All diam., longer than 6 in.	30
Lag, all diam over 6 in. longer.....	35
Lag, all diam x 6 in. & shorter.....	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

1/2 in. and smaller	35
9/16 to 1 in. inclusive	34
1 1/4 to 1 1/2 in. inclusive	32
1 1/2 in. and larger	27
On above bolts and nuts, excepting plow bolts, additional allowances of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

Semifinished Hexagon Nuts

	USS	SAE
7/16 in. and smaller	41	
1/2 in. and smaller	38	
1/2 in. through 1 in.	39	
9/16 in. through 1 in.	37	
1 1/4 in. through 1 1/2 in.	35	37
1 1/2 in. and larger	28	
In full case lots, 15 pct additional discount.		

Stove Bolts

Packages, nuts separate	\$61.75
In bulk	70.00

Large Rivets

(1/2 in. and larger)

	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

(7/16 in. and smaller)

	Pct off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

	Pct Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
3/4 to 1 in. x 6 in., SAE (1035), heat treated	35
Milled studs	19
Flat head cap screws, listed sizes ..	5
Fillister head cap, listed sizes.....	28

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢
Worcester, add 0.30¢.	

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per gross ton
Old range, bessemer	\$7.60
Old range, nonbessemer	7.45
Mesabi, bessemer	7.35
Mesabi, nonbessemer	7.20
High phosphorus	7.20

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	\$3.20
Joint bars, 100 lb	4.25
Light rails per 100 lb	3.55

Base Price
cents per lb

Track spikes	5.35
Axles	5.20
Screw spikes	6.00
Tie plates	4.05
Tie plates, Pittsburg, Calif.*	4.20
Track bolts, untreated	3.35
Track bolts, heat treated, to railroads	3.50
*Seattle, add 30¢.	

PRODUCING POINTS—Standard rails: Bessemer, Pa., 1; Ensley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, Pa., 3; Minnequa, Colo., 14; Steelton, Pa., 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 3; Lackawanna, N. Y., 3; Steelton, Pa., 3.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 77, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 79; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburgh, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24.

TOOL STEEL

F.o.b. mill

	W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	—	90.5¢
18	4	1	—	5	—	\$1.42
18	4	2	—	—	—	\$1.025
1.5	4	1.5	8	—	—	65¢
6	4	2	6	—	—	69.5¢
High-carbon-chromium						
Oil hardened manganese						
Special carbon						
Extra carbon						
Regular carbon						

Warehouse prices on and east of Mississippi are 2 1/4¢ per lb higher. West of Mississippi, 4 1/4¢ higher.

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$14.00 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$15.50 to \$16.00
Foundry, oven coke	
Buffalo, del'd	\$20.90
Chicago, f.o.b.	20.40
Detroit, f.o.b.	19.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.40
Swedeland, Pa., f.o.b.	20.90
Plainesville, Ohio, f.o.b.	21.00
Erie, del'd	\$20.25 to 21.00
Cleveland, del'd	22.62
Cincinnati, del'd	21.71
St. Paul, f.o.b.	21.50
St. Louis, del'd	21.60
Birmingham, del'd	18.75

FLUORSPAR

Washed gravel fluorspar, f.o.b. can	
Rosiclare, Ill.	
Effective CaF, Content:	Base price per net ton
70% or more	\$37.00
60% or less	34.00

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 15c to base price except Cincinnati
and New Orleans (*), add 10c; New York, Chicago and Boston, add 20c.)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4815 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4815 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.31	6.21-6.41	6.95-7.11	5.37	....	5.56	5.36	5.42	6.18	....	9.60-10.10	....	....
Birmingham	4.85	5.75	6.15	4.85	....	5.10	4.90	4.90	6.59	....	....	....	....
Boston	5.55	6.46-6.75	7.11-7.61	5.60	6.75	5.75	5.42	5.52	6.02	9.36-9.67	9.67	10.72	11.02
Buffalo	4.85	5.75	7.42-7.57	5.24	7.27	5.35	5.00	4.95	5.40	9.30	9.60	10.85	10.95
Chicago	4.85	5.75	6.85	4.85	5.45-6.15	5.10	4.90	4.90	5.40	8.90	9.20	10.25	10.55
Cincinnati*	5.18-5.51	5.84-6.28	6.59-6.93	5.28-5.43	....	5.53-5.85	5.33	5.33-5.48	6.08-6.20	9.74	9.99	11.19	11.44
Cleveland	4.85	5.75	6.70	5.03	....	5.21	5.01	5.01	5.40	9.08	9.35	10.40	10.70
Detroit	5.28-5.32	6.07-6.18	7.30-7.58	5.27-5.47	6.27-6.58	5.33-5.57	5.33	5.33-5.55	6.00-6.18	9.67	9.92	11.11	11.35
Houston	6.70-6.95	....	7.30	6.70	....	6.70	6.20	6.40-6.70	7.89	10.45	10.40	11.45	11.70
Indianapolis	5.29	6.13	7.44	5.29	7.30	5.54	5.34	5.34	6.14	11.25	11.39	....	....
Kansas City	5.45	6.35	7.40-7.45	5.45	6.05-6.90	5.70	5.50	5.50	6.05	9.50	9.30	10.85	9.65
Los Angeles	6.45	7.90	7.45	6.65	7.35	6.15	5.95	6.10	7.85 ¹⁴	10.85 ¹⁵	10.90 ¹⁶	12.45 ¹⁷	12.70 ¹⁸
Memphis	5.75-5.80	6.60	7.20	5.80-5.95	6.80	5.95-6.00	5.75	5.75	6.53	....	....	....	....
Milwaukee	5.03	5.93	7.02	5.03-5.38	6.32	5.28	5.08	5.08	5.63	9.53	9.73	10.99	11.23
New Orleans*	5.95	6.75	....	6.15	....	6.15	5.95	5.95	5.65 ⁹	....	....	....	....
New York	5.40	6.31	6.85-6.90	5.62	6.75	5.65	5.33	5.57	6.31	9.28	9.58	10.63	10.93
Norfolk	6.00	....	....	6.20	....	6.05	6.05	6.05	7.05	....	....	....	....
Omaha	6.13	....	6.33	6.13	....	6.30	6.18	6.18	6.88	....	....	....	....
Philadelphia	4.95	6.24 ¹³	6.63	5.40	6.29	5.35	5.10	5.40	5.96	9.05	9.35	10.82	10.87
Pittsburgh	4.85	5.75	6.90	5.00	6.00	5.05	4.90	4.90	5.40	8.90	9.20	10.25	10.55
Portland	6.50 ⁴ -7.05	8.00	8.80-9.10	6.85 ⁴	....	6.30 ⁸	6.35 ⁸	6.35 ⁸	8.25 ¹⁴	10.50 ⁸	10.10 ⁸	....	....
Salt Lake City	7.05	7.05	8.65	7.45 ³	....	5.65 ³	5.50 ³	7.10 ⁸	8.15	....	....	....	....
San Francisco	6.15 ⁸	7.50 ²	7.80	6.75 ⁸	8.25 ⁵	6.35 ⁸	5.90 ⁸	5.90 ⁸	7.55	10.90 ¹⁵	10.85 ¹⁵	12.40 ¹⁵	12.65 ¹⁵
Seattle	6.70 ⁴ -7.10	8.15 ² -8.65	8.80-9.30	6.70 ⁴	....	6.35 ⁴	6.30 ⁴	6.20 ⁴	8.15 ¹⁴	....	10.35 ¹⁵	....	13.10 ¹⁵
St. Louis	5.22-5.37	6.12-6.27	7.32	5.22	6.60-7.54	5.47	5.27	5.27	5.82	9.27-9.72	9.57-9.97	10.62-11.17	10.92-11.42
St. Paul	5.44	6.19-6.34	7.54-7.64	5.44	6.82	5.64-6.89	5.49	5.49	6.04	9.49	9.79	10.84	11.14

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED:

Sheets, strip, plates, shapes and bars, 400 to 1000 lb.

COLD-ROLLED:

Sheets, 400 to 1499 lb strip, extras on all quantities. Bars 1000 lb and over.

ALLOY BARS:

1000 to 1999 lb.

GALVANIZED SHEETS:

450 to 1499 lb.

EXCEPTIONS:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 499 lb; (4) 300 to 999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb; (18) 1000 to 1499 lb; (19) 1500 to 3499 lb; (20) 6000 lb and over.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	48.50	49.00	49.50	.....	Boston	Everett	\$0.50 Arb.	.....	50.00	50.50	.....	.....
Birmingham	38.88	39.38	.....	.....	.....	Boston	Steeltown	6.90	.....	.....	.....	.....	60.90
Buffalo	46.00	46.50	47.00	.....	.....	Brooklyn	Bethlehem	4.29	.....	52.79	53.29	53.79	.....
Chicago	46.00	46.50	46.50	47.00	.....	Cincinnati	Birmingham	6.70	45.58	46.08	.....	.....	.....
Cleveland	46.00	46.50	46.50	47.00	51.00	Jersey City	Bethlehem	2.63	.....	51.13	51.63	52.13	.....
Duluth	46.00	46.50	46.50	47.00	.....	Los Angeles	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Erie	46.00	46.50	46.50	47.00	.....	Mansfield	Cleveland-Toledo	3.33	49.33	49.83	49.83	50.33	54.33
Everett	.....	50.00	50.50	.....	.....	Philadelphia	Bethlehem	2.39	50.39	50.89	51.39	51.89	.....
Granite City	47.90	48.40	48.90	.....	.....	Philadelphia	Swedeland	1.44	49.44	49.94	50.44	50.94	.....
Ironton, Utah	46.00	46.50	.....	.....	.....	Philadelphia	Steeltown	3.09	.....	.....	.....	.....	57.09
Lone Star, Texas	46.00	46.50†	.....	.....	.....	Rochester	Buffalo	2.63	48.63	49.13	49.63	.....	.....
Neville Island	46.00	46.50	46.50	.....	.....	San Francisco	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Geneva, Utah	46.00	46.50	.....	.....	.....	Seattle	Geneva-Ironton	7.70	53.70	54.20	.....	.....	.....
Sharpsville	46.00	46.50	46.50	47.00	.....	St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....
Steeltown	48.00	48.50	49.00	49.50	54.00	Syracuse	Buffalo	3.58	49.58	50.08	50.58	.....	.....
Struthers, Ohio	46.00	.....	.....	.....	.....	Gulf Ports	Lone Star, Texas	.....	50.50	51.00†	.....	.....	.....
Swedeland	48.00	48.50	49.00	49.50	.....							
Toledo	48.00	48.50	48.50	47.00	.....							
Troy, N. Y.	48.00	48.50	49.00	.....	54.00								
Youngstown	48.00	46.50	48.50	47.00	.....							

[†] Low Phos., Southern Grade.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese

content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 0.01 to 0.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—\$59.50; f.o.b. Buffalo, \$60.75. Add \$1.00 per ton for each additional 0.50 pct Si up to 17 pct.

Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferro-silicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$68.56. High phosphorus charcoal pig iron is not being produced.

FERROALLOYS

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.	
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$172
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etna, Pa.	\$175
\$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn 19-21% Mn	
3% max. Si 3% max. Si	
Palmerton, Pa.	\$64.00 \$65.00
Pgh. or Chicago	65.00 66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn	25.25 27.10 28.30
0.10% max. C	24.75 26.60 27.80
0.15% max. C	24.25 26.10 27.30
0.30% max. C	23.75 25.60 26.80
0.50% max. C	23.25 25.10 26.30
0.75% max. C, 7.00% max. Si	20.25 22.10 23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$73.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.	
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Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
25% Si	17.00
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast Turnings Distilled	
Ton lots	\$2.05 \$2.95 \$3.75
Less ton lots	2.40 3.30 4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered.	
(65-72% Cr, 3% max. Si)	
0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35
Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.	
Carload bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.	
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S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, cents per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.	
0.20% max. C	1.09
0.50% max. C	1.05
9.00% min. C	1.04

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	\$2.25
Ferrovandium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primus)	3.10
Vanadium pentoxide, 88-92% V ₂ O ₅ , contract basis, per pound contained V ₂ O ₅	\$1.20
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	\$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.10
Calcium molybdate, 45-50%, f.o.b. Langeloth, Pa., per pound contained Mo.	9¢
Molybdenum oxide briquets, f.o.b. Langeloth, Pa.; bags, f.o.b. Wash., Pa., per pound contained Mo.	95¢
Ferrotitanium, 40%, regular grade, 10% C max., f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.25
Ferrotitanium, 25%, low carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads per net ton	\$160.00

Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	76.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	6.40¢
Alsilfer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.40¢
Ton lots	8.80¢

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	Carloads, Per 1000
First quality, Pa., Ky., Mo., Ill. (except Salina, Pa., add \$5)	\$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	11.50

Silica Brick	
Mt. Union, Pa., Ensley, Ala.	\$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	\$85.00 to 95.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	\$14.75 to 15.00
Silica cement, net ton, bulk, Utah and Calif.	21.00

Chrome Brick	Per Net Ton
Standard chemically bonded, Balt., Chester	\$69.00

Magnesite Brick	
Standard, Balt. and Chester	\$91.00
Chemically bonded, Balt. and Chester	80.00

Grain Magnesite	Std. ½-in. grains
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	\$56.00 to 58.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	\$30.50 to 31.00
in sacks with fines	35.00 to 35.50
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10¢; Missouri Valley, add 20¢	\$12.25

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.	
Swedish sponge iron c.l.f.	
New York, ocean bags	7.9¢ to 9.0¢
Domestic sponge iron, 98+%	
Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+%	31.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+%	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+%	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8%+ Fe	90.0¢ to \$1.75
Aluminum	27.00¢
Antimony	53.73¢
Brass, 10 ton lots	23.00 to 25.25¢
Copper, electrolytic	27.75¢
Copper, reduced	27.635¢
Cadmium	32.40
Chromium, electrolytic, 99% min.	\$3.50
Lead	21.43¢
Manganese	48.00¢
Molybdenum, 99%	12.65
Nickel, unannealed	66.00¢
Nickel, spherical, minus 30 mesh, unannealed	65.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.00¢
Tin	\$1.15 to \$1.25
Tungsten, 99%	12.90
Zinc, 10 ton lots	15.25 to 15.00¢

Special Fittings save TIME and MONEY

You can see how ARMCO Steel Pipe saved time and money on this plant piping job.

Engineers used special prefabricated ARMCO Steel Pipe fittings—and with good reason. At least twice the number of standard fittings would have been required to complete the work.

Special fittings like these are only one advantage of ARMCO Spiral Welded Pipe. The wide range of diameters (6 to 36 inches) with wall thicknesses from 9/64- to 1/2-inch, makes it possible for you to specify the one right size for the job.

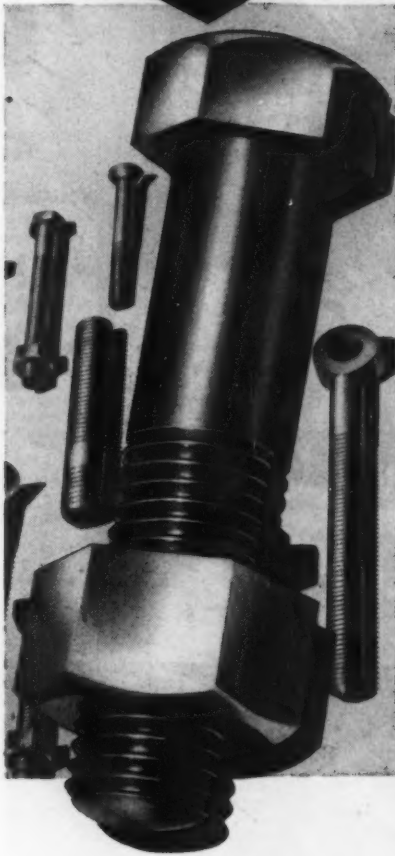
ARMCO Spiral Welded Pipe is easily and quickly installed because it is prefabricated to your layout. Lengths up to 50 feet, with fittings shop-welded to straight runs of pipe, mean faster installation—less chance for leaks. A wide variety of coatings and linings can be provided.

Try ARMCO Spiral Welded Pipe on that next piping job. You'll like its time- and money-saving features. Write for data. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 1565 Curtis St., Middletown, Ohio. Export: The Armco International Corporation.

ARMCO | **WELDED
STEEL
PIPE**



First for
**BOLTS
NUTS
STUDS**



- ★ Carbon Steel ★ Stainless Steel
- ★ Heat-treated ★ Silicon Bronze
- ★ Alloy Steels ★ Naval Brass
- ★ Monel Metal

You can count on a uniform Class 3 Fit when you buy Pawtucket threaded fasteners. Accurately made in standard dimensions — or to your specifications.

BETTER BOLTS SINCE 1882

Use Headed and Threaded Fasteners for Economy and Reliability



NEW

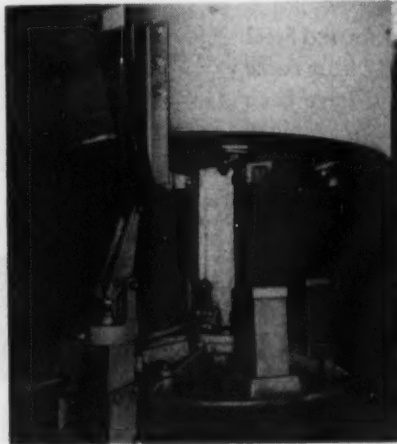
PRODUCTION IDEAS

Continued from Page 126

contact on the electrode and reduces the heating on both the stub and the holder. Length is 15 in., weight is 32 oz. *Martin Wells, Inc.* For more information, check No. 40 on the postcard on p. 37.

Throttle-Type Valve

A high pressure hydraulic throttle-type valve, termed the Proctomatic Valve, automatically controls the falling speed of weighted-type accumulators, preventing accumulator tanks or platforms from



crashing on bumper blocks. The valve automatically controls and protects accumulator fall. It is machined from solid forged steel blocks, with bronze bushings and stainless steel sliding plunger, seat, and spindle, and operates from 1500 to 5000 psi working pressure. *R. D. Wood Co.* For more information, check No. 41 on the postcard on p. 37.

Pipe Nipple Machine

A new roller cutter, single spindle pipe nipple machine chamfers both ends for threading and cuts off up to 100 nipples per min. Overall lengths ranging from $\frac{3}{8}$ to $1\frac{1}{2}$ in. are held within tolerance of a few thousandths of an inch, without slowdown in production. The anti-friction bearing, all

TOOL and DIE USERS!

**Pangborn
"Hydro-Finish"**

**Can
Help
You...**



It improves surface finish, removes oxide scale, increases tool and die life through proper maintenance. Hydro-Finish is the new versatile impact blasting process that uses a fine mesh abrasive suspended in water and holds tolerances to .0001 inches.

In the Tool Room, Hydro-Finish simplifies the manufacture and maintenance of tools, dies and molds. It reduces usual costly handwork and produces a surface virtually free from directional grinding lines.

In the Production Line, Hydro-Finish eliminates many tedious finishing operations. It reduces cost and time involved in buffing. It improves fatigue life of the metal parts it finishes. It cuts many manufacturing costs.

It can be used for surface finishing, lubrication control, removing discoloration, preparing surfaces for plating, finishing threaded sections, plus many other uses.

Find out today how Hydro-Finish can help you.

Write for Bulletin 1400 to
PANGBORN CORPORATION,
1201 Pangborn Blvd.,
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PANGBORNITE
The best abrasive for all liquid blasting needs.

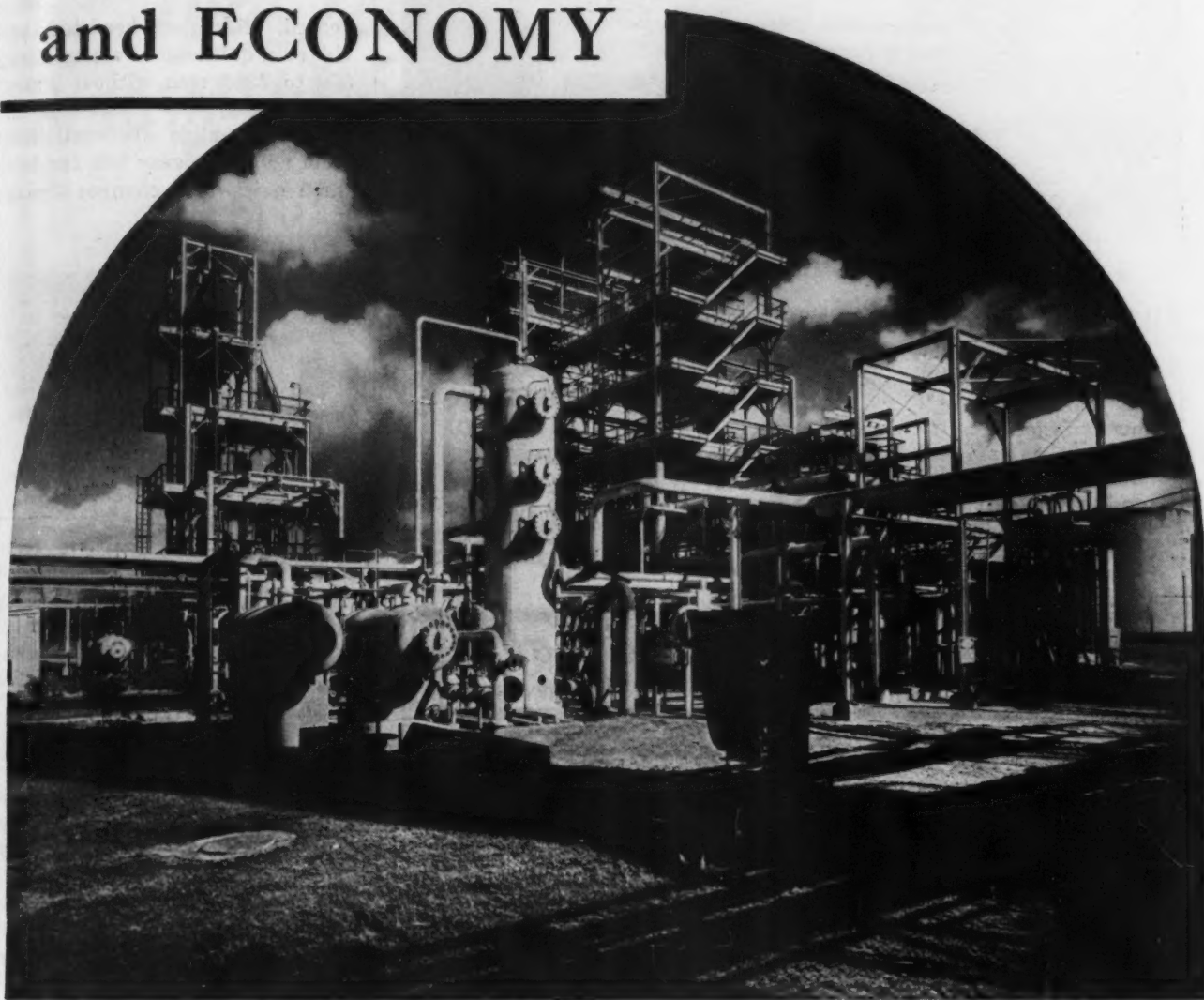
Available in many mesh sizes.

Look to Pangborn for all the latest developments in Blast Cleaning and Dust Control Equipment.

Pangborn

BLAST CLEANS CHEAPER
with the right equipment
for every job

EFFICIENCY and ECONOMY



IN the planning and execution of expansion programs, Stone & Webster Engineering Corporation offers to industrial organizations the efficiency and economy resulting from a competent and coordinated engineering and construction staff with broad experience in all phases of design and construction.



STONE & WEBSTER ENGINEERING CORPORATION

A SUBSIDIARY OF STONE & WEBSTER, INC.

September 22, 1949

147



This Pickling Tank Foundation Is Another Acid Proof Installation *by Ceilcote*

Our quarter century of experience is your guarantee of performance. When you plan construction of new pickling tanks, neutralizing tanks, floors, process tanks or fume ducts write for recommendations concerning your specific operating conditions. Representatives in most principal cities.

Ceilcote Products include acid and alkali proof—
• Linings • Membranes • Bonding Cements • Brick •
Protective coatings

- ★ FROM DESIGN TO
- ★ INSTALLATION OF
- ★ CORROSION-PROOF
- ★ EQUIPMENT YOU
- ★ CAN RELY ON

CEILCOTE



Corrosion Proof

MATERIALS • CONSTRUCTION • SUPERVISION

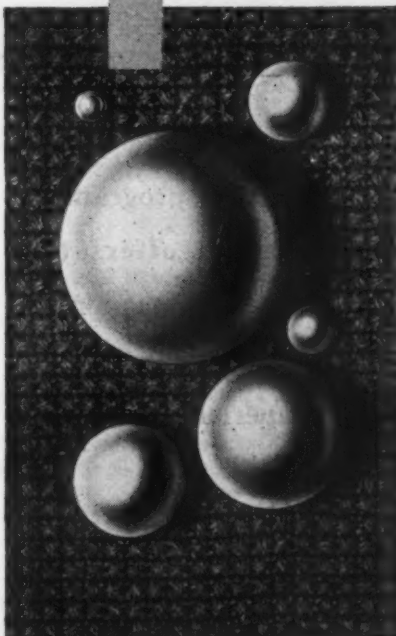
The CEILCOTE Company ROCKEFELLER BUILDING • CLEVELAND 13, OHIO

IN

Size and Spherical Accuracy

Perfection of Surface

Uniformity—Dependable Physical Quality



NOT A BETTER BALL MADE..

And the service results from every Strom metal ball prove it—not only in the finest precision ball bearings but also in the lot of other ball applications where Strom balls are doing the job better.

Strom has been making precision metal balls for over 25 years for all industry and can be a big help to you in selecting the right ball for any of your requirements. In size and spherical accuracy, perfection of surface, uniformity, and dependable physical quality, there's not a better ball made.

Strom STEEL BALL CO.

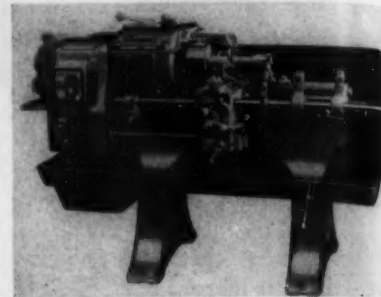
1850 So. 54th Ave., Cicero 50, Illinois

Largest Independent and Exclusive Metal Ball Manufacturer

NEW PRODUCTION IDEAS

Continued

geared, alloy steel headstock provides six quick speed changes from 560 to 2280 rpm without pick-off gears. The roller cutter slide and chamfering slide are cam driven from an apron gear box featuring three quick feed changes through



sliding gears. A patented roller pipe feed permits cutting and chamfering automatically, lengths from 1/4 to 12 in. *Bardons & Oliver, Inc.* For more information, check No. 42 on the postcard on p. 37.

Electric Finisher

Smooth, vibrationless operation plus straight-line sanding, rubbing and polishing are features of a new portable, electric finisher. Straight-line sanding duplicates the back and forth motion of hand work. It permits working up to moldings or right angles without marring or scratching. A streamlined rear handle provides comfortable one hand operation and a front guide handle is furnished for two hand



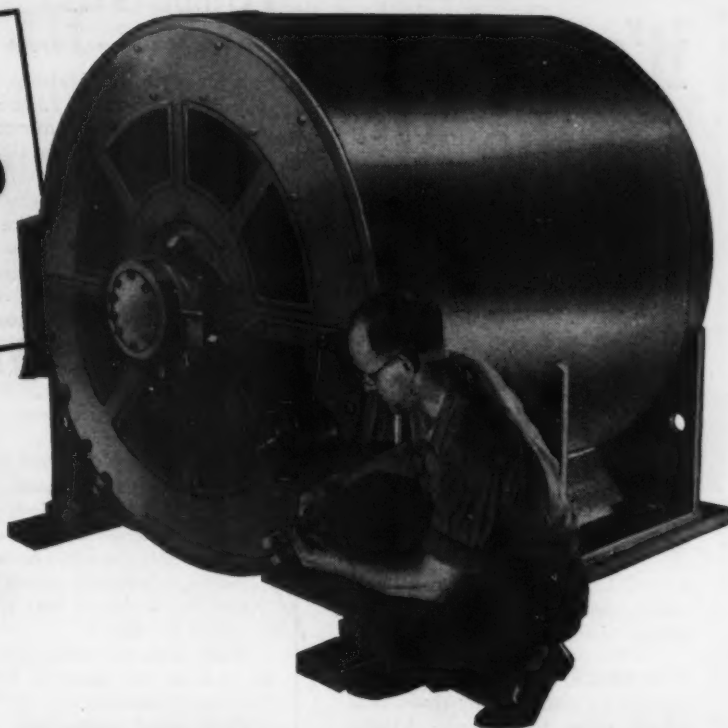
operation. The abrasive paper holder permits attaching several sheets at one loading. *Detroit Surfacing Machine Co.* For more information, check No. 43 on the postcard on p. 37.

Resume Your Reading on Page 41

**TUBE-TYPE
TOTALLY-ENCLOSED
FAN-COOLED
MOTORS!**

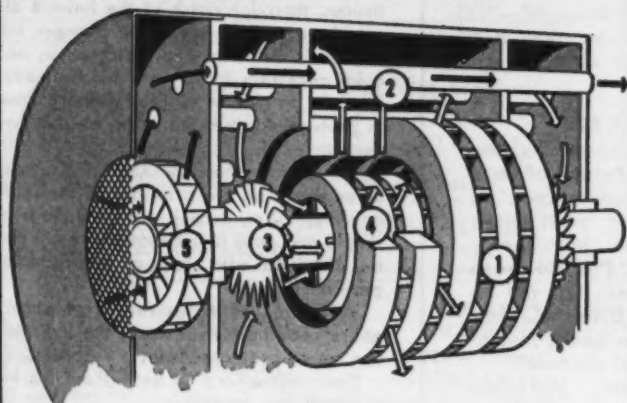
DIRT-

**AND CORROSION-
RESISTANT!**



PROOF!

How Tube Cooling Works



Stator core (1) is surrounded by tubes (2). Internal fans (3) circulate air through ducts (4) in rotor and stator and around tubes, transferring heat to tubes.

External fan (5) drives outside air through tubes, removing heat and keeping tubes clean. All electrical parts are enclosed. Dirt cannot enter.

*Totally-Enclosed Fan Cooled

- Install anywhere — indoors or out
- Heat exchanger is practically *self-cleaning*
- Sizes . . . 75 to several thousand horsepower

THIS ALLIS-CHALMERS tube-type TEFC* motor practically eliminates cleaning and other high maintenance costs associated with large motors exposed to dirty and corrosive atmospheres. And it does this with a simple, self-contained, tube-type, ventilating system.

All electrical parts — including the stator core — are enclosed. The simple heat transfer system keeps temperatures well within rated limits. Cleaning is rarely needed because air passages are unrestricted. Air flow through the straight tubes removes foreign matter.

Three years of field operation have proved important savings. Sizes from 75 hp and up. Also explosion-proof designs. For complete information, outline your requirements to your A-C Sales Office, or write for Bulletins 05B7150 and 51R7149.

ALLIS-CHALMERS, 1019A SO. 70 ST.
MILWAUKEE, WIS.



ALLIS-CHALMERS

it's in the AIR

There's plenty of Oxygen in the air and you can extract what you need, as you need it, by leasing Air Products generators and making your own.

BY THE CUBIC FOOT

OXYGEN

BY THE TON

With Air Products generators, your OXYGEN flows from the generator, through your pipe line, to the points of use, without handling.

You control your own supply and remove the risk of costly shut-downs which often result from delivery failure.

You eliminate the cost of handling, delivery, evaporation loss and selling cost, which is a large percentage of the total cost.

If you use over 200,000 cubic feet per month, you can assure your supply at low cost, without capital investment for equipment, by leasing Air Products generators and making your own oxygen from air. These same generators also produce high-quality nitrogen gas.



How to Cash-In on this Proven Method

Let us know how much OXYGEN you use per month, minimum and peak demands, whether you own a pipe line and storage bank, and any other pertinent information. We will show you how to make very substantial savings, as many other firms have done. Names on request.

AIR PRODUCTS, INC.
P. O. Box 538
Allentown, Pa.

Assure Your Supply at low cost with

Air Products
OXYGEN GENERATORS

FATIGUE CRACKS

Continued from Page 22

himself with his statement in the August 11 Assembly Line that "The new Buick 40 series announced here this week will not be referred to as a 1950 model but only as the new Buick 40 or Special."

This statement is like playing with matches in a sandpaper factory when you consider the number of people who have bought the new Specials. First to be heard from is Max E. Turley of Zionsville, Ind.

"I have noticed in several papers, etc., that the new Buick has been referred to as the '1950 Buick' . . . On my order it stated 1—1950 Special. Also on the identification form it stated 1950. If this is not the 1950 model, some of the dealers are badly misinforming the public. It really doesn't matter, but I would like to know which is right."

With that, he enclosed a clipping of a used car auction listing the '50 Buick Special

Confronted with this evidence, Patton ducked "Buick's official announcement specifically said these cars would not be designated as 1950 models," he pouted "What the trade or what Buick dealers do is something else again"

Our only suggestion is that owners of the new cars take advantage of the three oblong slits on the side of the hood of the new model. Obviously Buick's functional designers had a purpose in mind when they substituted these for the portholes on the side of the previous models. Simply station a gunner behind each row of slits. Then if anybody says it isn't a 1950 model—"rat-tat-tat-tat-tat"—mow 'em down. Should be a good idea for Dick Tracy, anyhow.

GROOVE OR RUT?

"The most impressive feature of the new format of IRON AGE is easy readability. . . . The changeover must have been a big job, but hardly enough for Mr. Post to go to sleep at the post. Or, did he repeat 'World Rivalry,' word for word, in two issues just to get a rise out of readers?"

—SIDNEY REIBEL, Materials Handling Consultant, Albert Kahn Associated Architects & Engineers, Inc.

It could have been that the typesetter thought the item, which appeared in identical form in the August 4 and 25 issues, was so significant that he set it twice, anticipating popular request. Or there may be some connection between this duplication and the fact that we have twins at home. We simply got in the groove again. Or should we say "rut."

Resume Your Reading on Page 23

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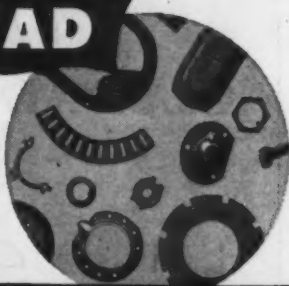
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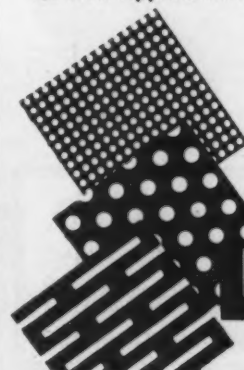
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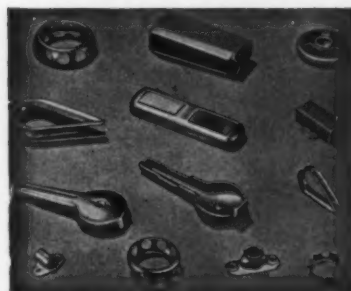
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Adv. on
page 74
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Iron Age

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GLOBAL LETTER

REVIEW OF WORLD MARKETS

Continued from Page 28

monazite sands. The reserves of zirconium near Poços de Caldas, Minas Geraes, cover an area of 484,000 sqm, are estimated at 2,000,000 tons, and the ore contains between 65 and 95 pct of zirconium dioxide.

This mineral is also found, associated with monazite sands, in the immense reserves which extend along the coast from Bahia, through Espirito Santo, to Rio de Janeiro, and on the banks of several rivers in those States and in Minas Geraes.

Has Strategic Minerals

Among Brazil's other deposits of strategic minerals are: Titanium ore, with an unusual percentage of titanium oxide, in many parts of Goiás, along the valleys of the Tocantins and Araguaia Rivers, and in Minas Geraes. Nickel, which is being mined in Goiás, where the reserves are estimated at 10,000,000 tons, and in Minas Geraes.

Other deposits, still unexploited, are known to exist in the States of Santa Catarina, Rio Grande do Sul and Rio de Janeiro. Valuable chromium deposits occur in Bahia, with reserves calculated at 4,000,000 tons.

Important beds of high-grade manganese ore exist in Bahia, Minas Geraes and Mato Grosso, with smaller ones in the States of San Paulo, Ceara, Maranhão and Santa Catarina. The Morro da Mina reserves in Minas Geraes are estimated at 5,000,000 tons. The comparatively recent discoveries of deposits at Amapá, in the far-north, and Itabira, in Minas Geraes, place Brazil among the leading nations as regards the number and importance of her manganese deposits, although not in respect of the quantities mined.

Finally, the known deposits of tungsten ore in the north-east, containing between 70 and 75 pct of tungsten oxide, number approximately 400, of which only one quarter is being worked.

Rail Development Needed

All these minerals are assuming increased importance owing to the international situation. Large quantities were shipped to the United States during the war, but as normal sources of supply reopened exports from Brazil

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GLOBAL LETTER

Continued

fell off. To compete in world markets in normal times processes for mining and treatment of minerals must be modernized, and transport must be improved in many areas. Many deposits are situated at great distances from consuming centers and embarkation ports, and lack rail communications, or the latter are inadequate for a large volume of cargo.

The National Ry. Dept. drew up a comprehensive program of extensions and improvements in 1946, and is now going ahead for more rapidly than it has ever done in the past. It aims at connecting all districts of economic importance by rail and improving the existing system. The latter consists of many isolated units, in several of which light rails, narrow gages, steep gradients and sharp curves preclude heavy loads and high speeds.

German Steel Output Still Climbing

Frankfort—Western Germany is the only country of Europe where steel output made further progress in August, according to preliminary unofficial reports. Crude steel output reached a total of 834,407 metric tons in the three largest western zones, compared with 794,571 tons in July.

Of the total output the British zone accounted for 778,381 tons, compared with 738,033 tons in July. Even though August accounted for one more working day than July, the progress was impressive, compared with the records of other European countries.

A grimmer note is seen in the continued decline in orders, especially for heavy products. The supply of tubes is improving, with delivery delays getting close to those of prewar days. Strong pressure is being exerted toward increasing exports of iron and steel products. A request for doubling the present quota has already been laid down before the military governments.

Propositions for increasing domestic prices have also been made. These are known to be at unrealistic levels despite direct or indirect subsidies. A comparison of home and export prices of coke shows a good example.

Dutch Operating New Ovens

The Hague—The Koninklijke Nederlandsche Hoogovens en Staalfabrieken at Ymuiden has put in operation a new battery of 30 coke ovens. These were built mainly with Dutch materials according to plans prepared by an American firm.

Refractories were imported from the United States. This new plant will permit an increase of 400 tons per day in coke output, as well as an important increase in coke oven gas.

Resume Your Reading on Page 29

THE IRON AGE